A 66-year-old lady has recently been diagnosed with adenocarcinoma and is being discussed at the regional MDT regarding treatment options. Her CT showed a T2, N1, M0 tumour in the right upper lobe, which was confirmed on PET CT. She is otherwise fit and well, with a performance status of 1.

Which of the following would be the most appropriate initial choice of treatment for this patient?

- Chemotherapy
- Lobectomy
- Pneumonectomy
- Radiotherapy
- Wedge resection

Ufone 1:16 AM 88%
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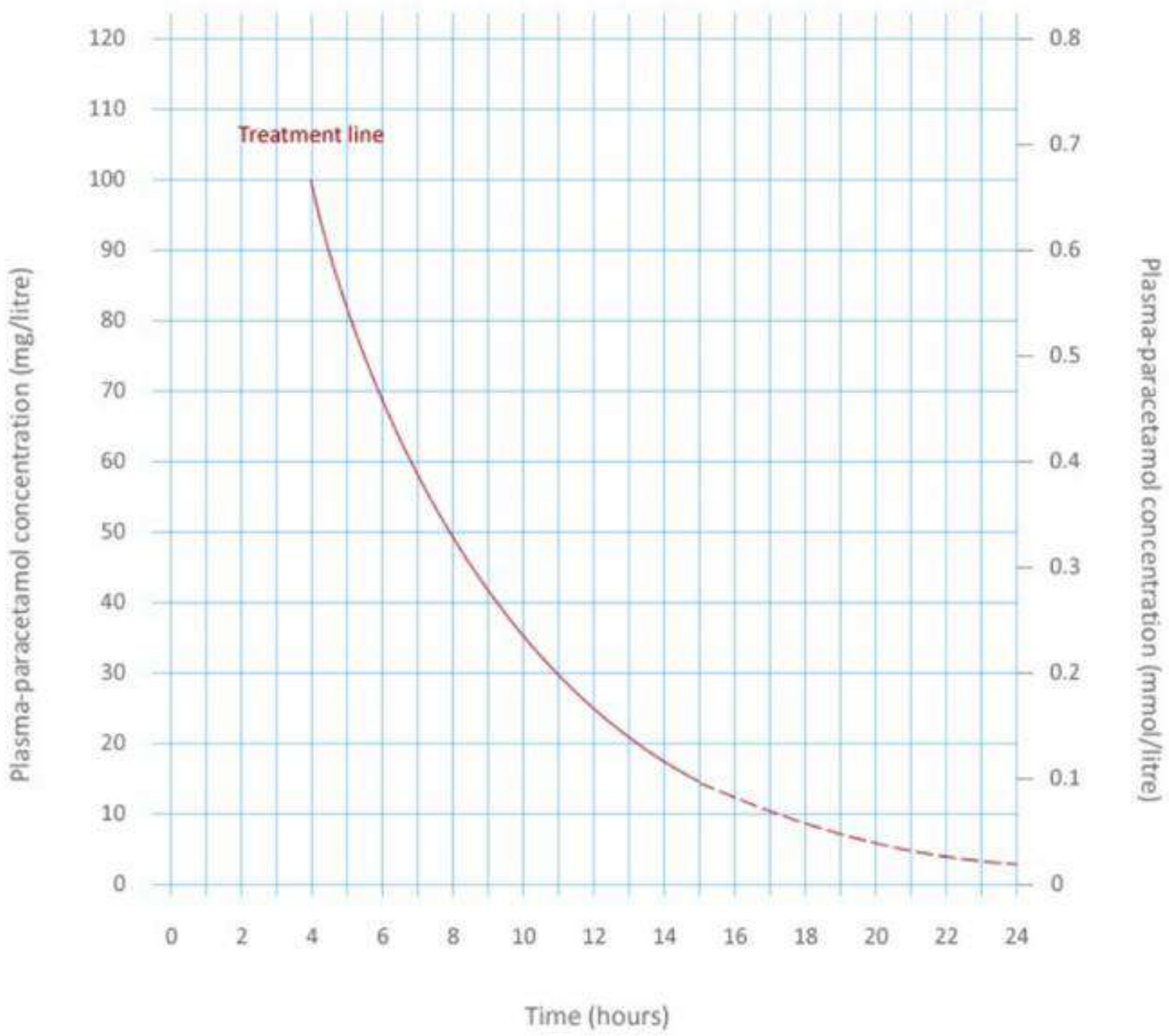
A 30 year old woman is admitted after being found at home by her friends intoxicated and having taken a paracetamol overdose. She had consumed a bottle of vodka and taken a couple of boxes of paracetamol, possibly 30-40 tablets, approximately 4-8 hours earlier. On examination she was stuporous with otherwise normal observations. Her results were normal and her paracetamol level was 100mg/l.

The paracetamol nomogram is shown below.




Which of the following is the most appropriate approach for the initial management of this patient?

- ○ Activated charcoal
- ○ IV acetylcysteine
- ○ No treatment required
- ○ Oral acetylcysteine
- ○ Oral methionine

| | | |
|---|---|---|
| | Aspirin | 2% |
| | Evening primrose oil | 8% |
| answer | Ferrous sulphate ← Correct | 21% |
| | Fluoxetine | 16% |
| answer selected | St John's wort ✖ Incorrect | 53% |

This patient has had stable thyroid function on 100 micrograms of thyroxine but her most recent TFTs reveal that the dose is now inadequate. Of the drugs listed, the use of ferrous sulphate may be responsible for reduced absorption of thyroxine through chelation of thyroxine in the stomach. It is important to remind patients to take their thyroxine 2 hours before taking ferrous sulphate.

A 35 year old woman presents to the A+E as she has become pathetically tired. The GP hasn't done anything about her problems. She has been treated with thyroxine 100 micrograms for the last 5 years for hypothyroidism and all previous TFTs have been normal. She informs you that she is compliant in taking her thyroxine. On this occasion her thyroid function tests reveal:

| | |
|---|---|
| **Free T4** | 8.8 pmol/l (9-23) |
| **TSH** | 12.2 mu/l (0.5-5) |

Which of the following drugs that she is taking is likely to have contributed to the adverse change in thyroid function test results?

- ○ Aspirin
- ○ Evening primrose oil
- ○ Ferrous sulphate
- ○ Fluoxetine
- ○ St John's wort

Digoxin toxicity ✔ Correct answer selected — 63%

Hydroxychloroquine maculopathy — 32%

Occipital infarct — 0%

Retinal haemorrhage — 3%

This patient has been given digoxin for atrial fibrillation rate control, and has now become digoxin toxic with the classic symptom of yellow vision (xanthopsia). Other symptoms of digoxin toxicity include weakness, fatigue, dizziness, arrythmia and is exacerbated by hypokalaemia.

The unusual dosing regime of hydroxychloroquine was only given as a distractor. Hydroxychloroquine maculopathy usually presents with deterioration of visual acuity and there is an obvious “bulls eye” macular lesion. In end stage maculopathy there is severe atrophy of the retinal pigment epithelium. Maculopathy is dose dependent and duration of treatment dependent. Corneal deposits can occur with hydroxychloroquine but bear no dose or time relationship and disappear on cessation of the drug.

A 67 year old lady who was recently treated for atrial fibrillation with warfarin according to INR and digoxin 250 µg daily three weeks ago, attends clinic for follow up regarding her SLE. She has been taking Hydroxychloroquine 400 mg for 5 days per week for the last 10 years and she has not seen the opticians for many years. She tells you that she is feeling generally unwell with visual disturbance in that she is now seeing in "yellow". Examination reveals normal visual fields and she was able to count fingers easily at the bedside.

Her recent investigations are:

| | | |
|---|---|---|
| **ESR** | 20 mm/hr | (<40mm/hr) |
| **CRP** | 10 mg/L | (< 10 mg/L) |
| **C3** | 0.45 iU/ml | (0.75 - 1.61 g/L) |
| **C4** | 0.25 iU/ml | (0.16 - 0.47 g/L) |
| **dsDNA (ELISA method)** | 17 iU/ml | (<20 iU/ml) |

What is the most likely explanation for her symptoms?

- Cataracts
- Digoxin toxicity
- Hydroxychloroquine maculopathy
- Occipital infarct
- Retinal haemorrhage

Give diazepam IV/IM 1%

Give haloperidol IV/IM ✔ 56%

Correct answer selected

Give lorazepam IV/IM 10%

Move to a side room on a ward and just observe 32%

This patient is acutely agitated, is likely to have mild dementia and may be delirious. It is therefore, important to assess the patient properly and for their own safety as well as staff safety, the patient should receive sedation. The most appropriate is a typical antipsychotic such as haloperidol.

Benzodiazepines are not recommended in the elderly other than for delirium tremens as they are more respiratory sedatory.

Sedation would then enable this patient to be evaluated appropriately for delirium or any other cause of her agitation. In this case, the mild dementia, change of environment, possible use/dependence on zopiclone as well as infection

An 83 year old lady is admitted from home as she has been more breathless of late. She lives alone and usually manages well. She was seen by her daughter who felt she was more breathless than usual as she has a background of COPD associated with smoking. The GP decided to admit her. She used inhalers and took zopiclone at night to help her sleep. Other than some mild memory problems she had little else of note in her history. She did not drink any alcohol but smoked about 5 cigarettes daily.

On examination she seemed fine, her temperature was 37C, pulse 80 bpm reg and blood pressure 110/80 mmHg. Her oxygen saturations were 94% on air. Other than occasional wheeze there was nothing else of note on examination. Full blood count, U+Es were normal and her CRP was 15 mg/l (<5). She was given oral antibiotics by the night team and was to be reviewed by the consultant the following morning.

The following morning she was agitated, aggressive and would not let anyone perform any observations. She would lock herself in the toilet and felt that people were intent on harming her. She was walking around the unit quite unperturbed and did not otherwise seem distressed but would not permit any medical staff to go near her nor would she listen to what they were saying.

Which of the following is the most appropriate approach to the management of this patient?

- Give chlorpromazine IV/IM
- Give diazepam IV/IM
- Give haloperidol IV/IM
- Give lorazepam IV/IM
- Move to a side room on a ward and just observe

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- IM adrenaline 1%
- IV adrenaline 4%
- IV dobutamine 1%
- IV glucagon ✔ Correct answer 94%

selected

- IV hydrocortisone 0%

This woman has taken a life threatening overdose of beta-blockers and is critically ill. She requires immediate transfer to ICU; the most appropriate initial treatment for a beta-blocker overdose would be IV glucagon. Other approaches to treatment include dialysis in atenolol overdose as well as High Dose Insulin Infusion. Similarly, once the airway is secure, one could also use activated charcoal.

A 45 year old woman with a history of depression is admitted after taking an overdose of atenolol. She had taken approximately 40x50mg tablets 2 hours earlier. On examination, she had a blood pressure of 86 mmHg systolic and a pulse of 48 bpm regular. Her ECG revealed a sinus bradycardia without clear p waves. Her GCS was 13.

She is administered IV fluids but which of the following should initially be given to this patient?

- IM adrenaline
- IV adrenaline
- IV dobutamine
- IV glucagon
- IV hydrocortisone

| | | |
|---|---|---|
| | Amlodipine | 16% |
| | Atenolol | 3% |
| | Irbesartan | 4% |
| | Nicorandil ✔ Correct answer selected | 70% |
| | Verapamil | 7% |

Sildenafil is a phosphodiesterase-5 (PDE-5) inhibitor, drugs that are well known to interact with nitrates, resulting in dramatic hypotension. Nicorandil will also produce this reaction. These drugs should not, therefore, be used in patients who also use a GTN spray.

# Acute Medicine SCE Revision Clinical pharmacology & poisoning

Question ID #3550

A 65 year-old man presents with a three year history of erectile dysfunction. His libido is unimpaired but he has been unable to have intercourse with his wife for some months, which they both find distressing. His GP prescribed him sildenafil. However, he is admitted as an emergency after developing profound weakness and giddiness an hour or so after having had the sildenafil. He is noted to be hypotensive at 70/50 mmHg.

Which of the following concomitant therapies is likely to have precipitated this effect with sildenafil?

- Amlodipine
- Atenolol
- Irbesartan
- Nicorandil
- Verapamil

| | |
|---|---|
| No requirement for anticoagulation/antiplatelet therapy | 3% |
| Treat with aspirin | 9% |
| Treat with clopidogrel | 1% |
| Treat with dipyridamole | 0% |
| Treat with warfarin ✔ Correct answer selected | 86% |

This man has a CHADS-VASC score of 2 based on his age<65 (0) plus diabetes and hypertension (1 each). This, in conjunction with paroxysmal atrial fibrillation, puts him at risk of stroke/TIA and therefore anticoagulation is the most appropriate approach – either with warfarin or the newer antithrombotics – dabigatran, apixaban and rivaroxaban.

SIGN Guidance

A 50 year old man is admitted with an episode of palpitations. He is known to suffer from paroxysmal atrial fibrillation and is being treated with bisoprolol 5mg daily. This is the second occasion over the last 6 months that he has been admitted with palpitations. The ECG confirms atrial fibrillation at a rate of 96 bpm. He has a 3 year history of hypertension and diabetes for which he is treated with metformin and amlodipine. His blood pressure is 124/80 mmHg. Previous investigations reported on clinical portal reveal a normal echo. Within an hour he reverts back to sinus rhythm.

Which of the following approaches would you take regarding long term anticoagulation/antiplatelet therapy?

- No requirement for anticoagulation/antiplatelet therapy
- Treat with aspirin
- Treat with clopidogrel
- Treat with dipyridamole
- Treat with warfarin

Peer responses

| | |
|---|---|
| IV digoxin | 0% |
| IV metoprolol | 7% |
| Oral bisoprolol | 20% |
| Oral dronedarone | 5% |
| Oral flecainide ✔ Correct answer selected | 67% |

As this is an acute onset AF, a rhythm control strategy should be adopted. The patient is stable and does not require an immediate DCCV. According to NICE guidelines If pharmacological cardioversion has been agreed on clinical and resource grounds for new-onset atrial fibrillation, offer a choice of flecainide or amiodarone to people with no evidence of structural or ischaemic heart disease or amiodarone to people with evidence of structural heart disease.

A 46 year old man is admitted complaining of acute onset of palpitations. He has no other history of note and takes no medication. He denies the use of illicit drugs but drinks about 20 units of alcohol weekly. He does not smoke. He was playing golf this morning when he became slightly short of breath upon climbing a hill and was aware of palpitations. He denies being aware of palpitations before. He finished playing but the fast heart rate persisted and he has been aware of this for roughly 2-3 hours. On examination, he appears well with a pulse of 140 bpm irregular, blood pressure 116/76 mmHg. His BMI is 27.3 $kg/m^2$, clinically he is euthyroid. CVS examination is otherwise normal. His ECG reveals him to be in atrial fibrillation and chest x-ray is normal.

Which of the following is the most appropriate initial approach to managing this patient?

- IV digoxin
- IV metoprolol
- Oral bisoprolol
- Oral dronedarone
- Oral flecainide

Peer responses

| | |
|---|---|
| IV labetalol ✔ Correct answer selected | 73% |
| IV furosemide | 0% |
| Oral amlodipine | 18% |
| Oral ramipril | 9% |
| Sublingual nifedipine | 0% |

Severe hypertension is classified as a systolic above 180 and a diastolic above 110 mmHg. Hypertensive crisis is associated with severe hypertension in the presence of end organ damage such as retinopathy; flame shaped haemorrhages and papilloedema; hypertensive encephalopathy; acute coronary syndrome; pulmonary oedema. This requires urgent treatment with the aim of reducing blood pressure by roughly 20-25%. IV drugs such as labetalol, nitroprusside (unlicensed), nicardipine and hydralazine can be used. In those with severe hypertension but lacking end organ damage, this is termed hypertensive urgency and oral antihypertensives can be employed.

Whilst nitroprusside is a potential answer here, it is not licensed for this use, is difficult to accurately titrate being very short acting, needs HDU monitoring, and with renal or hepatic failure can be associated with thiocyanate toxicity. Labetalol is the better answer.

A 36-year-old male is referred in by the GP after presenting with headaches which have deteriorated over the last 2 weeks. He is found to have a high blood pressure of 220/120 mmHg and is admitted as an emergency. There is nothing particularly of note in his history. He is a non-smoker and drinks little alcohol. He does not take any drugs and denies illicit substance abuse.

On examination he has a BMI of 30.3 kg/m$^2$, a blood pressure of 224/122 mmHg and a pulse of 88 bpm. Examination of his fundi reveal some flame shaped haemorrhages. His ECG reveals left ventricular hypertrophy and urinalysis is negative.

Tests reveal:

| Test | Result | Normal range |
|---|---|---|
| Sodium | 141 mmol/l | 134-144 |
| Potassium | 3.5 mmol/l | 3.5-5 |
| Urea | 9.2 mmol/l | 3-8 |
| Creatinine | 110 micromol/l | 50-100 |

Which of the following is the most appropriate approach to the management of this patient?

- IV labetalol
- IV furosemide
- Oral amlodipine
- Oral ramipril
- Sublingual nifedipine

GLASGOW BLATCHFORD SCORE 0%

HASBLED SCORE ✔ Correct answer selected 85%

ROCKALL SCORE 5%

The HASBLED score will calculate the risk of major haemorrhage in 1 year in patients with atrial fibrillation. CHADS VASC and CHADS VASC 2 are used to evaluate risk of thrombotic stroke in atrial fibrillation. GBS and Rockall scores are used in GI bleeding.

| | Condition | Points |
|---|---|---|
| H | Hypertension: (uncontrolled, >160 mmHg systolic) | 1 |
| A | Abnormal renal function: Dialysis, transplant, Cr >2.26 mg/dL or >200 µmol/L Abnormal liver function: Cirrhosis or Bilirubin >2x Normal or AST/ALT/AP >3x Normal | 1 |
| S | Stroke: Prior history of stroke | 1 |
| B | Bleeding: Prior Major Bleeding or Predisposition to Bleeding | 1 |
| L | Labile INR: (Unstable/high INRs), Time in Therapeutic Range <60% | 1 |
| E | Elderly: Age > 65 years | 1 |
| B | Prior Alcohol or Drug Usage History (> 8 drinks/week) Medication Usage Predisposing to Bleeding: (Antiplatelet agents, NSAIDs) | 1 |

A 78-year-old lady presents to the MAU with atrial fibrillation with a fast ventricular rate. Her medical history includes hypertension, for which she takes Ramipril 2.5mg. You commence her on a Beta-blocker for rate control, and discuss the option of commencing anticoagulant therapy for stroke prevention. She is concerned about the risk of bleeding.

Which of the following scoring systems could you use to help evaluate this patient's risk of major haemorrhage

- CHADS VASC SCORE
- CHADS VASC 2 SCORE
- GLASGOW BLATCHFORD SCORE
- HASBLED SCORE
- ROCKALL SCORE

Cushing's syndrome 4%

Phaeochromocytoma 2%

Primary hyperaldosteronism ✔ 86%

Correct answer selected

Renovascular disease 5%

**Explanation**

In primary aldosteronism (PA), there is excess aldosterone production, which is autonomous, causing excessive sodium reabsorption within the distal nephron. It leads to hypertension and suppression of the renin-angiotensin II system, which means patients will have high aldosterone and low renin levels. Plasma aldosterone/plasma renin activity ratio is a useful screening test.

Severe urinary loss of potassium and hydrogen ions, exchanged for sodium at the distal nephron, may result in hypokalaemia and metabolic alkalosis. However, not all patients will have all metabolic abnormalities.

A 17-year-old boy presents to A&E with a minor sporting injury. However, he is noted to have a blood pressure reading of 180/110 mmHg. He is admitted and his blood pressure does not settle below 160/90 mmHg. His dad says there is a family history of high blood pressure and strokes on his father's side.

Clinical examination is unremarkable.

| Test | Result | Normal ranges |
|---|---|---|
| Sodium | 144 mmol/L | 133 - 146 |
| Potassium | 3.1 mmol/L | 3.5 - 5.3 |
| Urea | 5 mmol/L | 2.5 - 7.8 |
| Creatinine | 80 umol | 50 - 90 |
| Venous bicarbonate | 31 mEq/L | 22 to 28 |

What is the most likely diagnosis?

- Coarctation of the aorta
- Cushing's syndrome
- Phaeochromocytoma
- Primary hyperaldosteronism
- Renovascular disease

IV diazepam ✔ Correct answer 41%

selected

IV glucagon 5%

IV insulin/glucose 2%

IV metoprolol 4%

Supportive therapy only required 49%

SSRI overdose is quite common and usually safe, though citalopram is an exception as it may prolong the QT interval. Serotonin syndrome may develop and is associated with symptoms of anxiety, agitation, tachycardia, seizures and hyperthermia. In this case, the patient has taken a high dose of citalopram and is agitated. She has been given activated charcoal and the appropriate treatment for the agitation, which may prevent the development of seizures, is IV diazepam. Oral cyproheptadine is also an agent that has been used with some success in the treatment of SSRI overdose.

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A 45 year old woman with a history of depression is admitted after taking an overdose of citalopram together with consuming alcohol in a suicide attempt. Her relatives state that following an argument she went off and was found in the local park some 4 hours later, inebriated, having taken about 30x40mg citalopram tablets. On examination, she had a temperature of 39.5C, a pulse of 110 bpm reg and a blood pressure of 100/60 mmHg. She is agitated with a GCS of 15. ECG reveals a sinus tachycardia. The patient is treated with activated charcoal and IV fluids.

Which of the following is the most appropriate approach to the management of this patient?

- IV diazepam
- IV glucagon
- IV insulin/glucose
- IV metoprolol
- Supportive therapy only required

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Which of the following would you suggest for the management of this man's atrial fibrillation?

Peer responses

| | |
|---|---|
| Add oral digoxin to bisoprolol | 8% |
| Increase dose of bisoprolol | 25% |
| Switch bisoprolol to dronedarone | 9% |
| Switch bisoprolol to flecainide ← Correct answer | 52% |
| Switch bisoprolol to sotalol | 6% |

This man has recurrent paroxysmal atrial fibrillation and the patient should be switched to an alternative agent with guidelines recommending flecainide, provided there is no evidence of IHD, and the objective is maintenance of sinus rhythm. This patient will not qualify for anticoagulation as his CHA2DS2-VASc score is 0.

Further Reading:

- NICE guidelines

A 56 year old man is admitted with an episode of palpitations. He is known to suffer from paroxysmal atrial fibrillation and is being treated with bisoprolol 5mg daily. He finds that the bisoprolol does 'slow him down physically' but he has been compliant with treatment. This is the second occasion over the last year that he has been admitted with palpitations. The ECG confirms atrial fibrillation at a rate of 96 bpm. He knows when the AF happens as he feels strange, gets a little breathless and can feel an irregular pulse. Usually it settles after a couple of hours rest, but on this occasion it has persisted for about 3 hours so he came to hospital. He previously had an ECHO which was normal.

Which of the following would you suggest for the management of this man's atrial fibrillation?

- ○ Add oral digoxin to bisoprolol
- ○ Increase dose of bisoprolol
- ○ Switch bisoprolol to dronedarone
- ○ Switch bisoprolol to flecainide
- ○ Switch bisoprolol to sotalol

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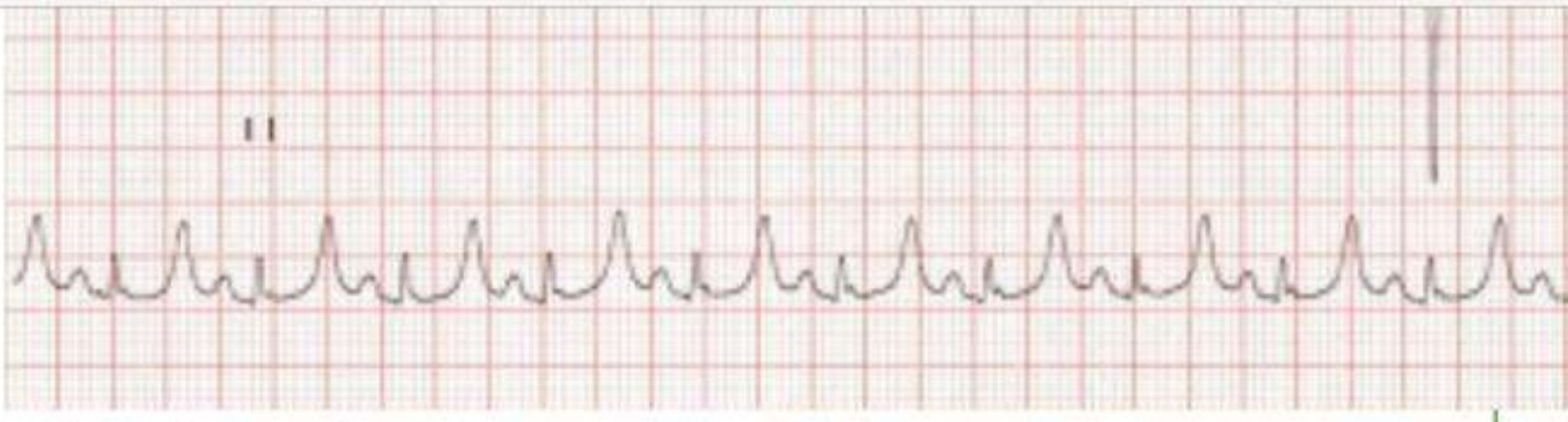



What does the ECG suggest?

Peer responses

| | |
|---|---|
| Hypercalcaemia | 2% |
| Hyperkalaemia ✔ Correct answer selected | 94% |
| Hypocalcaemia | 1% |
| Hypokalaemia | 1% |
| Hypothermia | 2% |

This ECG shows tented T waves and p waves with a tachycardia suggestive of hyperkalaemia.

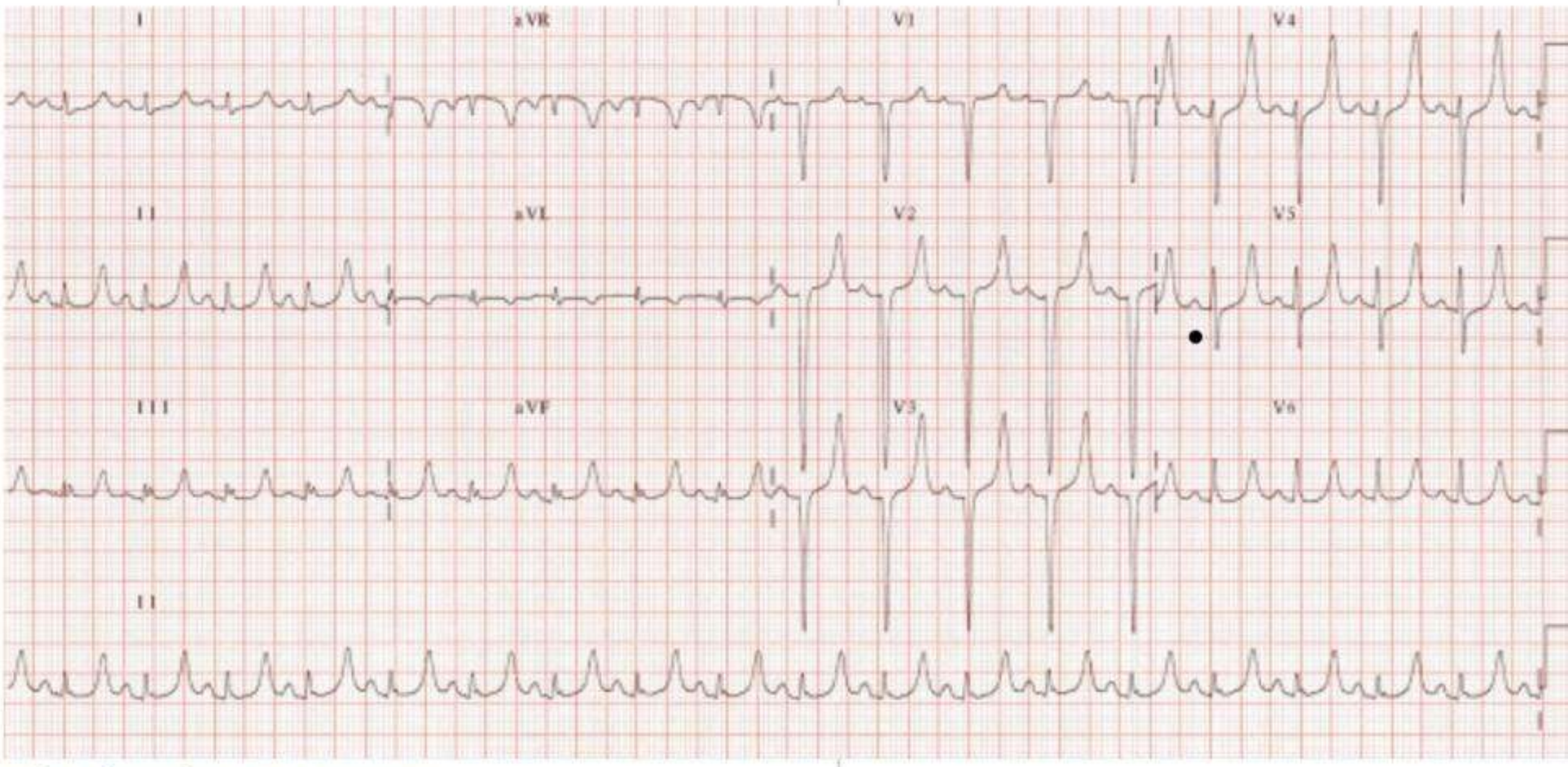
Next

Exit

# Revision cardiovascular medicine

Question ID #3780

This is the ECG obtained on a 77 year old man with type 2 diabetes who was admitted with lethargy and tiredness.




What does the ECG suggest?

- ○ Hypercalcaemia
- ○ Hyperkalaemia
- ○ Hypocalcaemia
- ○ Hypokalaemia
- ○ Hypothermia

# Sepsis definitions

- SIRS is ≥2/4 of: T>38 or <36, HR>90, RR>20 or PaCO2>32, or WBC>12 or <4 or 10% bands.
- Sepsis: SIRS + Infection
- Septic Shock: Sepsis + hypotension after 2L bolus
- Severe Sepsis: Sepsis + poor end organ perfusion (hypotension, high lactate, urine output <0.5mL/kg/hr, acute lung injury, high creatinine or bilirubin, low platelets or coagulopathy)

Rheumatoid arthritis

Sjogren's syndrome 19%

Systemic lupus erythematosis 70%

✔ Correct answer selected

Takayasu's arteritis 2%

Wegener's granulomatosis 0%

Pericarditis may occur in many rheumatological conditions but most commonly in SLE, rheumatoid arthritis and systemic sclerosis. It is not usually seen in ANCA positive or large vessel vasculitis. It may be the presenting symptom in SLE but tends to present later in rheumatoid and without the typical ECG findings (including diffuse concave upward, saddle shaped, ST elevation, except in aVR and V1 where it is usually depressed. T waves are upright in the leads with ST elevation, and the PR segment deviates opposite to P-wave polarity).

Echocardiography is the imaging modality of choice as it is widely available at the bedside. Patients should be seen by a cardiologist. NSAIDs are often useful for analgesia. Glucocorticoids are also helpful both for pericarditis symptoms and to treat the underlying disease. For recurrent and large effusions fenestration or resection of the pericardium may be required.

The CRP is usually normal in SLE except when there is co-existant serositis or infection.

Reference:

A 28 year old female who is a solicitor presents with chest pain which is worse on inspiration and on lying flat. She has suffered with fatigue and arthralgia for some time. She has frequent mouth ulcers and suffers with a dry mouth. Recently she has had discomfort swallowing.

On examination she is mildly tachycardic and has an audible rub at the left lower sternal edge. Her hands are puffy and there is discolouration of the fingers. The joints of the hands are tender.

Investigations are as follows:

| | | |
|---|---|---|
| **CRP** | 88 mg/dl | (<10) |
| **ESR** | 102 mm/hr | (0-10) |
| **Hb** | 10.8 g/dl | (11.5-16.5) |
| **WCC** | $3.2x10^9$/l | (4-11) |
| **Neutrophils** | $2.1x10^9$/l | (2.0-7.5) |
| **Lymphocytes** | $0.6x10^9$/l | ( 1.5-4.0) |
| **Platelets** | $102x10^9$/l | (150-400) |
| **IgG** | 5.4 mg/l | (5.5-16.5) |
| **IgA** | 3.2 mg/l | (0.8-4.0) |
| **IgM** | 1.2 mg/l | (0.4-2.0) |
| **Rheumatoid Factor** | 25 iu/l | (<20) |
| **ANA** | 1:1600 (positive) | |
| **ENA** | negative | |
| **ANCA** | negative | |

ECG; concave upward ST elevation in V2-6.

Chest x-ray; normal cardiac outline with small pleural effusion at left base.

Echocardiography; Small pericardial effusion. No evidence of tamponade.

What is the most likely diagnosis?

- Rheumatoid arthritis
- Sjogren's syndrome
- Systemic lupus erythematosis
- Takayasu's arteritis
- Wegener's granulomatosis

| | | |
|---|---|---|
| ○ | Prolonged PR Interval | 16% |
| ○ | QT shortening ✔ Correct answer selected | 72% |
| ○ | ST elevation | 0% |
| ○ | Tall tented T waves | 0% |
| ○ | Widened QRS complexes | 12% |

The predominant abnormality here will relate to the markedly elevated calcium, not the mild hypokalaemia. The QT interval is typically shortened in hypercalcaemia. Other features in severe hypercalcaemia include J waves and bizarre QRS appearance.

A 62 year old woman is admitted to MAU through her GP as she has become increasingly unwell over the last few days. She is lethargic, has had occasional episodes of abdominal pain, and is clinically dehydrated. She has a recent history of metastatic breast cancer with bony involvement, for which she is receiving palliative treatment. Her results reveal:

| | |
|---|---|
| Sodium | 144 mmol/l (134-144) |
| Potassium | 3.1 mmol/l (3.5-5.5) |
| Calcium | 4.1 mmol/l (2.2-2.6) |

Which of the following would you expect to find on the ECG?

- ○ Prolonged PR Interval
- ○ QT shortening
- ○ ST elevation
- ○ Tall tented T waves
- ○ Widened QRS complexes

Peer responses

Admit and arrange cardiology review on Monday — 26%

Discharge and request outpatient CT coronary angiography ← — 43%

Correct answer

Discharge and request outpatient exercise test ✖ Incorrect answer selected — 28%

Reassure and discharge with no follow up — 0%

Request routine cardiological review — 4%

**Explanation:**

In this case, the high sensitivity troponin is <14 and has been taken over 6 hours after the onset of pain. This is reassuring and excludes a diagnosis of acute coronary syndrome (ACS), indicating that he can be discharged. However, the history is highly suggestive of ischemic heart disease (IHD) plus he has quite a few risk factors. Therefore, further investigation should be undertaken. NICE suggests that one should offer 64-slice (or above) CT coronary angiography if clinical assessment indicates typical or atypical angina. You may also be inclined to commence him on beta blockers, aspirin and statin at discharge.

**Reference:**

A 62-year-old man presents on a Friday with chest pain. 8 hours ago at 3 in the morning he developed a left chest heaviness that radiated to his left arm. He felt rather sweaty with this pain. The pain lasted 1 hour or so and subsided. He was concerned enough to go to the GP for an emergency appointment in the morning and the GP sent him straight in as query acute coronary syndrome.

He has no medical history of note but has a family history of ischemic heart disease (IHD) with his father having died of a myocardial infarction (MI) at the age of 62. He is a smoker of 10 cigarettes daily.

There is little to find on examination and he is pain free now. His ECG is normal. Results reveal: high sensitivity troponin T taken at admission and 8 hours after pain stopped 12 ng/l (<14).

What is the most appropriate management strategy for this patient?

- ○ Admit and arrange cardiology review on Monday
- ○ Discharge and request outpatient CT coronary angiography
- ○ Discharge and request outpatient exercise test
- ○ Reassure and discharge with no follow up
- ○ Request routine cardiological review

Peer responses

| | | |
|---|---|---|
| answer | Hypercalcaemia ← Correct | 18% |
| | Hyperkalaemia | 1% |
| | Hypocalcaemia | 20% |
| answer selected | Hypokalaemia ✖ Incorrect | 58% |
| | Hypomagnesaemia | 3% |

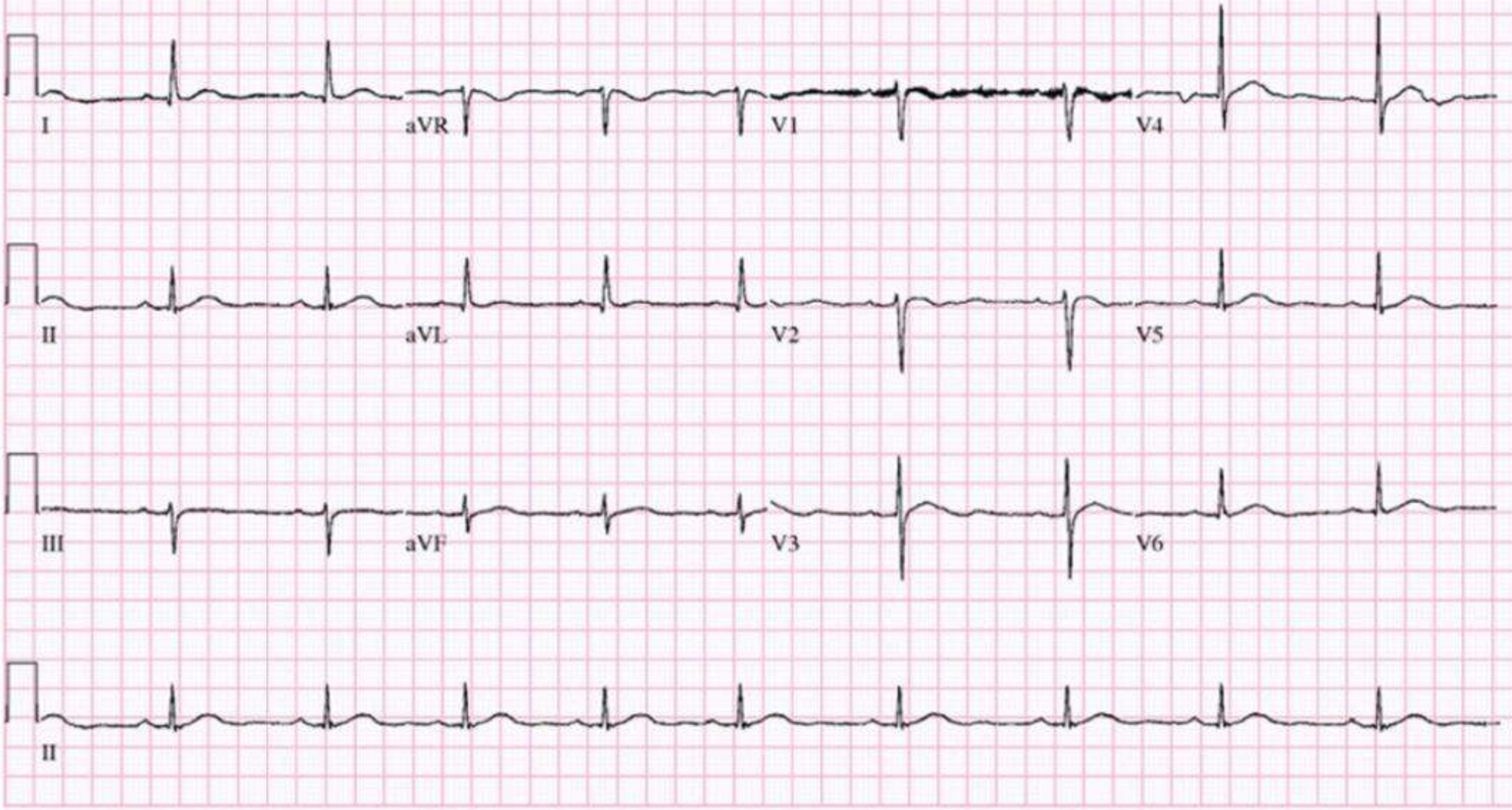
This ECG reveals a short QT interval, which is typical of hypercalcaemia. The normal QT interval is 0.36-0.42s. In this case, the QT interval is ~8 small squares 0.32s.

# Acute Medicine SCE Revision Cardiovascular medicine

Question ID #3572

This is the ECG taken on a 70 year old male admitted with a 10 day history of feeling unwell with associated nausea and occasional vomiting.

Which of the following electrolyte abnormalities would you expect to find to explain this ECG?




- ○ Hypercalcaemia
- ○ Hyperkalaemia
- ○ Hypocalcaemia
- ○ Hypokalaemia
- ○ Hypomagnesaemia

Ufone 7:27 PM 100%
studyprn.com

following should initially be given to this patient?

Peer responses

- IM adrenaline 1%
- IV adrenaline 4%
- IV dobutamine 1%
- IV glucagon ✔ Correct answer 94% selected
- IV hydrocortisone 0%

This woman has taken a life threatening overdose of beta-blockers and is critically ill. She requires immediate transfer to ICU; the most appropriate initial treatment for a beta-blocker overdose would be IV glucagon. Other approaches to treatment include dialysis in atenolol overdose as well as High Dose Insulin Infusion. Similarly, once the airway is secure, one could also use activated charcoal.

- Adhi Sharma (2016) Treatment of Beta-blocker

A 45 year old woman with a history of depression is admitted after taking an overdose of atenolol. She had taken approximately 40x50mg tablets 2 hours earlier. On examination, she had a blood pressure of 86 mmHg systolic and a pulse of 48 bpm regular. Her ECG revealed a sinus bradycardia without clear p waves. Her GCS was 13.

She is administered IV fluids but which of the following should initially be given to this patient?

- IM adrenaline
- IV adrenaline
- IV dobutamine
- IV glucagon
- IV hydrocortisone

Peer responses

Admit and monitor only 26%

Admit, monitor and give activated charcoal ✔ Correct answer selected 72%

Admit, treat with ipecac 2%

Discharge after giving activated charcoal 0%

Discharge as unlikely to have any further problems 0%

This patient has taken a potentially life threatening dose of verapamil and requires admission and monitoring. Calcium channel blocker overdose is treated very much like beta blocker overdose and, in this case, activated charcoal should be given immediately and the patient given IV fluids and monitored. If bradycardia and hypotension should develop, glucagon can be given.

An 18 year old woman is admitted as an emergency after having a row with her parents and then taking her father's tablets. She had taken a pack of 30x120mg verapamil SR, 2 hours earlier. On admission, she seemed fine and regretted taking the tablets. Her blood pressure was 110/80 mmHg and pulse was 65 bpm reg.

Which of the following is the most appropriate approach to the management of this patient?

- Admit and monitor only
- Admit, monitor and give activated charcoal
- Admit, treat with ipecac
- Discharge after giving activated charcoal
- Discharge as unlikely to have any further problems

Heart rate <110 bpm 1%

Inability to complete sentences in one breath 24%

Normal PaCO2 ✔ Correct answer selected 67%

PEF 33-50% predicted 6%

Respiratory rate <25 2%

Hyperventilation in asthma should cause a low PaCO2 as CO2 is ‘blown off’. A normal CO2 in an unwell asthmatic suggests that the ventilator exchange mechanisms are beginning to fail. All the other answers are markers of acute severe asthma.

A 39 year old man attends A&E with supraventricular tachycardia. He has never had it before, but feels well other than having severe palpitations. His ECG confirms SVT at a rate of 190 bpm. His only medical history is that of asthma, which has required intensive care admission in the past.

After chemically cardioverting him with adenosine he develops bronchospasm, and becomes very wheezy.

Which of the following is an indicator of life threatening asthma?

- Heart rate <110 bpm
- Inability to complete sentences in one breath
- Normal $PaCO_2$
- PEF 33-50% predicted
- Respiratory rate <25

A 65 year old man is admitted with an episode of palpitations. He is known to suffer from paroxysmal atrial fibrillation and is being treated with bisoprolol 7.5mg daily. This is the second occasion over the last 6 months that he has been admitted with palpitations. The ECG confirms atrial fibrillation at a rate of 96 bpm. He knows when the AF happens as he feels strange, gets a little breathless and can feel an irregular pulse. Usually it settles after a couple of hours' rest but on this occasion it has persisted for about 3 hours so he came to hospital. He previously had an ECHO which was normal and had an exercise test in the past which was normal. Thyroid function tests were also normal. In his past history he is known to be hypertensive and is overweight.

Which of the following characterises his annualised risk of stroke associated with his paroxysmal atrial fibrillation?

- ○ Less than 1%
- ○ Approximately 2%
- ○ Approximately 5%
- ○ Approximately 7%
- ○ Greater than 7%

| | | |
|---|---|---|
| ○ | Less than 1% | 6% |
| | Approximately 2% ← Correct answer | 44% |
| | Approximately 5% ✖ Incorrect answer selected | 26% |
| | Approximately 7% | 20% |
| ○ | Greater than 7% | 4% |

The CHADS-VASC is used to determine risk of stroke in AF and therefore the requirement for anticoagulation. In this man, the CHAD-VASC is: 2 - 1 each for hypertension and age

absent = 0, present =1

| | |
|---|---|
| C – Congestive Heart Failure- | absent =0, present =1 |
| Hypertension – | absent =0, present =1 |
| Age | <65 0; 65-72 = 1, >75 =2 |
| Diabetes | absent =0. Present = 1 |
| Prior TIA/CVA | absent =0, present =2 |
| Vascular disease | absent = 0, present =1 |
| Sex | male =0, female = 1 |

In this scenario, the annualised risk of stroke/TIA is low at 2-3% making this patient moderately high risk, in whom anticoagulation should be considered.

Further Reading:

Ufone 3:57 PM 15%
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A 65 year old man is admitted with an episode of palpitations. He is known to suffer from paroxysmal atrial fibrillation and is being treated with bisoprolol 7.5mg daily. This is the second occasion over the last 6 months that he has been admitted with palpitations. The ECG confirms atrial fibrillation at a rate of 96 bpm. He knows when the AF happens as he feels strange, gets a little breathless and can feel an irregular pulse. Usually it settles after a couple of hours' rest but on this occasion it has persisted for about 3 hours so he came to hospital. He previously had an ECHO which was normal and had an exercise test in the past which was normal. Thyroid function tests were also normal. In his past history he is known to be hypertensive and is overweight.

Which of the following characterises his annualised risk of stroke associated with his paroxysmal atrial fibrillation?

- ○ Less than 1%
- ○ Approximately 2%
- ○ Approximately 5%
- ○ Approximately 7%
- ○ Greater than 7%

Mark Skip Exit

Can discharge and refer for rapid access chest pain clinic 26%

Refer for urgent cardiology opinion 9%

Repeat a troponin within 3 hours after the initial test ← Correct answer 46%

**Explanation:**

The high sensitivity troponin T test has revolutionised the management of patients with suspected IHD. Two measurements are required if the patient presents within 6 hours and the value is <14 to exclude acute coronary syndrome (ACS). In this case, the patient presented 4 hours later and has a pretty good story for IHD. Therefore, the patient should have a repeat troponin arranged as the initial step and, if ACS is excluded, the patient should be referred for assessment, such as ETT.

**Reference:**

A 54-year-old man presents with chest pain. 4 hours ago he developed a central chest pain, which he describes as heavy in nature and left-sided. There was some radiation to the jaw. It settled down within about 30 minutes but he decided to seek advice. A+E have referred him to the medics.

He has no past medical history of note but has a family history of ischemic heart disease (IHD) with his father having had a myocardial infarction (MI) at the age of 62. He is a smoker of 10 cigarettes daily.

There is little to find on examination and he is pain free now. His ECG is normal. Relevant results: high sensitivity troponin T taken at admission and 4 hours after onset of pain 12 ng/l (<14)

What is the most appropriate management strategy for this patient?

- ○ Can discharge and advise outpatient exercise test
- ○ Can discharge and continue follow up under GP
- ○ Can discharge and refer for rapid access chest pain clinic
- ○ Refer for urgent cardiology opinion
- ○ Repeat a troponin within 3 hours after the initial test

Ufone 2:45 PM 26%
studyprn.com

Which of the following is the most appropriate treatment for this man?

Peer responses

| | |
|---|---|
| Amiodarone | 2% |
| Bisoprolol | 22% |
| DC Cardioversion | 15% |
| Flecainide ✔ Correct answer selected | 60% |
| Sotalol | 1% |

His AF has likely been precipitated by alcohol. Given his relatively young age and he has a structurally normal heart on echo. As the duration is less than 48 hours Flecainide would be the most appropriate choice here.

**Further Reading**

- Atrial Fibrillation

Next Exit

# Acute Medicine SCE Revision Cardiovascular medicine

Question ID #3989

A 45 year old male with no past medical history of note presents to A&E feeling generally unwell with palpitations which came on earlier in the day. Examination is unremarkable. He had consumed a large quantity of alcohol at a stag weekend the previous day. His ECG confirms atrial fibrillation with a rate of 145 bpm. His blood pressure is stable at 110/60 mmHg and his bedside echo is reported as normal.

Which of the following is the most appropriate treatment for this man?

- Amiodarone
- Bisoprolol
- DC Cardioversion
- Flecainide
- Sotalol

Continue CPR and give intravenous Amiodarone — 42%

Continue CPR and give intravenous Lignocaine — 2%

Place a magnet over the ICD and shock externally — 53% ✔ Correct answer selected

Place a magnet over the ICD to induce overdrive pacing — 2%

Suspend CPR until a cardiac physiologist can disable the ICD's defibrillation function — 1%

External defibrillation should be used where an ICD has failed to terminate a shockable rhythm or the rhythm is recurrent. Pads should be placed on the chest at least 10-15cms away from the device, or the anterior-posterior positions used. Placing a magnet over an ICD will disable the defibrillation function but it will continue to pace for bradycardia. Placing a magnet over a standard bradycardia pacemaker will trigger a short burst of ventricular pacing at a rate of approximately 100 bpm, after which normal function resumes. There is no significant risk to a CPR provider who is in contact with a patient during an ICD shock.

A 55 year old man with a history of ischaemic heart disease was found collapsed at home. He has an implantable cardioverter defibrillator (ICD) and has received several shocks from the device in the ambulance, for recurrent ventricular tachycardia. On arrival in Resus he is in pulseless ventricular tachycardia and cardiopulmonary resuscitation (CPR) is ongoing.

Which of the following is the most appropriate management?

- ○ Continue CPR and give intravenous Amiodarone
- ○ Continue CPR and give intravenous Lignocaine
- ○ Place a magnet over the ICD and shock externally
- ○ Place a magnet over the ICD to induce overdrive pacing
- ○ Suspend CPR until a cardiac physiologist can disable the ICD's defibrillation function

A 25 year old asthmatic woman presents with increasing dyspnoea and wheeze over 3 days, requiring repeated doses of salbutamol. On examination, she is struggling to complete sentences. Heart rate is 130 bpm, blood pressure 100/60 mmHg, respiratory rate is 36 breaths/min, oxygen saturation is 80% on room air. On auscultation the chest is silent. While receiving continuous nebulised Salbutamol, she suddenly arrests.

Which of the following is the most likely cause of her arrest?

- ○ Cardiac arrhythmia
- ○ Hypokalaemia
- ○ Pulmonary embolism
- ○ Severe bronchospasm and mucus plugging
- ○ Tension pneumothorax

Ufone 12:31 PM 44%
studyprn.com

arterial blood gas sample

Central venous line insertion and rewarming 0%

Intravenous fluid bolus and broad spectrum antibiotics ✔ Correct answer selected 86%

Intravenous fluid bolus and rewarming 9%

Noradrenaline and broad spectrum antibiotics 3%

The patient has severe sepsis. Fluid resuscitation and broad spectrum antibiotics (after blood cultures) are part of the "Sepsis Six" management, which should be completed within the first hour of treatment. Central venous access and use of inotropes should be considered later, if the patient does not respond to fluid resuscitation. Infection in the elderly may not result in raised temperature due to blunted inflammatory response. Gram negative sepsis can cause low temperature.

An 83 year old woman presents with a 1 day history of drowsiness, confusion and urinary incontinence. She has a past history of type 2 diabetes for which she takes metformin and gliclazide together with ramipril and amlodipine for associated hypertension.

On examination, her heart rate is 120 bpm, blood pressure 80/60 mmHg, temperature 35.4 C, oxygen saturation is 92% on room air and she has a respiratory rate of 28/min. She is drowsy but rousable. Her results reveal a white cell count of 13.1 (4-10), a CRP of 110 mg/dl (<5) and a lactate of 5 mmol/l (<1.5).

Which of the following is the most appropriate immediate management?

- ○ Broad spectrum antibiotics and arterial blood gas sample
- ○ Central venous line insertion and rewarming
- ○ Intravenous fluid bolus and broad spectrum antibiotics
- ○ Intravenous fluid bolus and rewarming
- ○ Noradrenaline and broad spectrum antibiotics

Pulsed VT with BP 101/80 mmHg 1%

Pulsed VT with preceding symptoms of chest pain, but who is now pain free 0%

Pulsed VT with signs of cardiac failure ✔ Correct answer selected 61%

Pulsed VT with symptoms of shortness of breath 5%

All of the above 32%

ALS guidelines recommend immediate DC cardioversion for all decompensated tachycardias. Criteria for decompensation include:

- Chest pain
- Signs of cardiac failure
- Hypotension
- Impaired GCS.

Ufone 12:13 PM 44%
studyprn.com

Peer responses

- Pulsed VT with BP 101/80 mmHg 1%
- Pulsed VT with preceding symptoms of chest pain, but who is now pain free 0%
- Pulsed VT with signs of cardiac failure ✔ Correct answer selected 61%
- Pulsed VT with symptoms of shortness of breath 5%
- All of the above 32%

ALS guidelines recommend immediate DC cardioversion for all decompensated tachycardias. Criteria for decompensation include:

- Chest pain
- Signs of cardiac failure
- Hypotension
- Impaired GCS.

Next Exit

You are part of the crash team at a local district general hospital. You are called to a 78 year old patient with ventricular tachycardia, but who still has a cardiac output.

Which of the following scenarios would you deliver urgent electrocardioversion?

- Pulsed VT with BP 101/80 mmHg
- Pulsed VT with preceding symptoms of chest pain, but who is now pain free
- Pulsed VT with signs of cardiac failure
- Pulsed VT with symptoms of shortness of breath
- All of the above

A 65 year old man attends for dialysis. He was unable to attend his usual session the previous day. He tells nursing staff he had a "bad night" because of back pain and took an extra Amitriptyline to help him sleep. 10 minutes into dialysis he arrests.

Which of the following is the most likely mechanism of arrest?

- Asystole
- Hyperkalaemia-mediated ventricular tachycardia/fibrillation
- Pulseless electrical activity due to pulmonary embolism
- Tricyclic antidepressant toxicity causing ventricular tachycardia/fibrillation
- Uraemic pericardial effusion causing tamponade and pulseless electrical activity

Peer responses

| | |
|---|---|
| 1mg adrenaline IM | 4% |
| 1mg adrenaline IV ✔ Correct answer selected | 75% |
| 0.5mg atropine | 12% |
| DC cardioversion | 1% |
| External pacing | 7% |

The rhythm above shows pulseless electrical activity. The correct management according to guidelines is to give 1mg adrenaline IV and continue with CPR. PEA is not a shockable rhythm so is not appropriate, and external pacing should only be used if the patient has a cardiac output.

You attend a cardiac arrest on MAU. A 75-year-old man has collapsed and upon assessing his airway, breathing and circulation you determine he has no cardiac or respiratory output. You secure his airway and commence cardio-pulmonary resuscitation. You perform an ECG rhythm trace (below):

What is the correct initial management?

- 1mg adrenaline IM
- 1mg adrenaline IV
- 0.5mg atropine
- DC cardioversion
- External pacing

Activated charcoal 2%

IV acetylcysteine ✔ Correct 97%

answer selected

No treatment required 1%

Oral acetylcysteine 0%

Oral methionine 0%

This patient has a paracetamol concentration which is above the paracetamol nomogram for treatment. She has also consumed the overdose with alcohol, which may act as an enzyme inducer. She is stuporous and therefore cannot have oral acetylcysteine/methionine, which is also an option for treatment and, therefore, should receive IV acetylcysteine.

A 64 year old female patient has a history of osteoarthritis and hypercholesterolaemia for which she takes co-codamol and simvastatin. She was recently prescribed Lisinopril as she had a third successive hypertensive reading at her GP surgery. Additionally she has been prescribed cinnarizine for motion sickness.

A week later she presents in the pharmacy asking for something to treat a raised, red rash on her legs, arms, and trunk.

What medication is most likely to be responsible for these symptoms?

- Cinnarizine
- Codeine
- Lisinopril
- Paracetamol
- Simvastatin

**Your transaction is successful!**
**Reference Number 244527**

Account Name
HARIS SHOAIB

Account Type
Domestic

Account Number
16637900348603

Amount
PKR 3,000.00

Transfer To
Haris SHOAIB

Transfer From
086500100237132200 14

Bank Details
Habib Bank Limited,
Pakistan

What would you like to do next?

Go to Home

Share

Atenolol 3%

Bendrofluazide ✔ Correct answer selected 81%

Doxazosin 8%

Simvastatin 3%

Lithium is a drug used for bipolar affective disorder. It is a drug that needs to be kept within a narrow therapeutic range. If the drug level goes above this range, lithium toxicity occurs. Lithium toxicity ranges in severity from mild tremors, agitation, and confusion to ataxia, convulsions and arrhythmias. Interactions can occur between lithium and other agents that precipitate toxicity; in particular, diuretics both loop and thiazides through sodium depletion and reduction of excretion can increase the potential for lithium toxicity. ACE inhibitors may also cause lithium toxicity as can NSAIDs.

A 58 year old woman presented to her GP with tremor and agitation. She has a past history of depression for which she has been on long term lithium therapy which has provided effective control. More recently, her GP noted that she was hypertensive and commenced new therapies. Initiation of which of the following is most likely to have precipitated her lithium toxicity?

- Amlodipine
- Atenolol
- Bendrofluazide
- Doxazosin
- Simvastatin

Peer responses

- Give fresh frozen plasma ✖ 12%

Incorrect answer selected

- Give IV prothrombin complex concentrate ← Correct answer 70%
- Give IV tranexamic acid 6%
- Give IV vitamin k 1%
- No prior treatment required; patient can undergo neurosurgery 11%

This patient is taking one of the direct oral anticoagulants (NOAC), apixaban which is a direct Xa inhibitor and has developed a subdural haematoma following a fall. Surgery is deemed necessary due to clinical deterioration and therefore the anticoagulative effect of apixaban should be reversed with a PCC such as octaplex or factor vIIIa inhibitor bypass activity.

Peer responses

| | |
|---|---|
| Cinnarizine | 19% |
| Codeine | 3% |
| Lisinopril ✔ Correct answer selected | 70% |
| Paracetamol | 0% |
| Simvastatin | 7% |

ACE inhibitors are known to cause urticarial rash, especially lisinopril. The lisinopril should be stopped since there is some risk of anaphylaxis and alternative antihypertensive medication should be considered. A suitable antihistamine should be prescribed, but in this case the patient should be warned not to take it with cinnarizine, which is also an antihistamine.

Admission to the Coronary Care Unit for supportive care 9%

Primary Percutaneous Coronary Intervention (PPCI) ✔ Correct answer selected 73%

Thrombolysis for myocardial infarction 3%

Thrombolysis for pulmonary embolism 8%

Treatment dose low molecular weight heparin 7%

This patient has had an inferior myocardial infarction and the the Gold standard treatment is PPCI, ideally within 120 minutes of presentation. Pregnancy does not preclude coronary intervention (with tailored drug treatment). Bare metal stents are preferred, to minimise the duration of dual antiplatelet therapy post intervention.

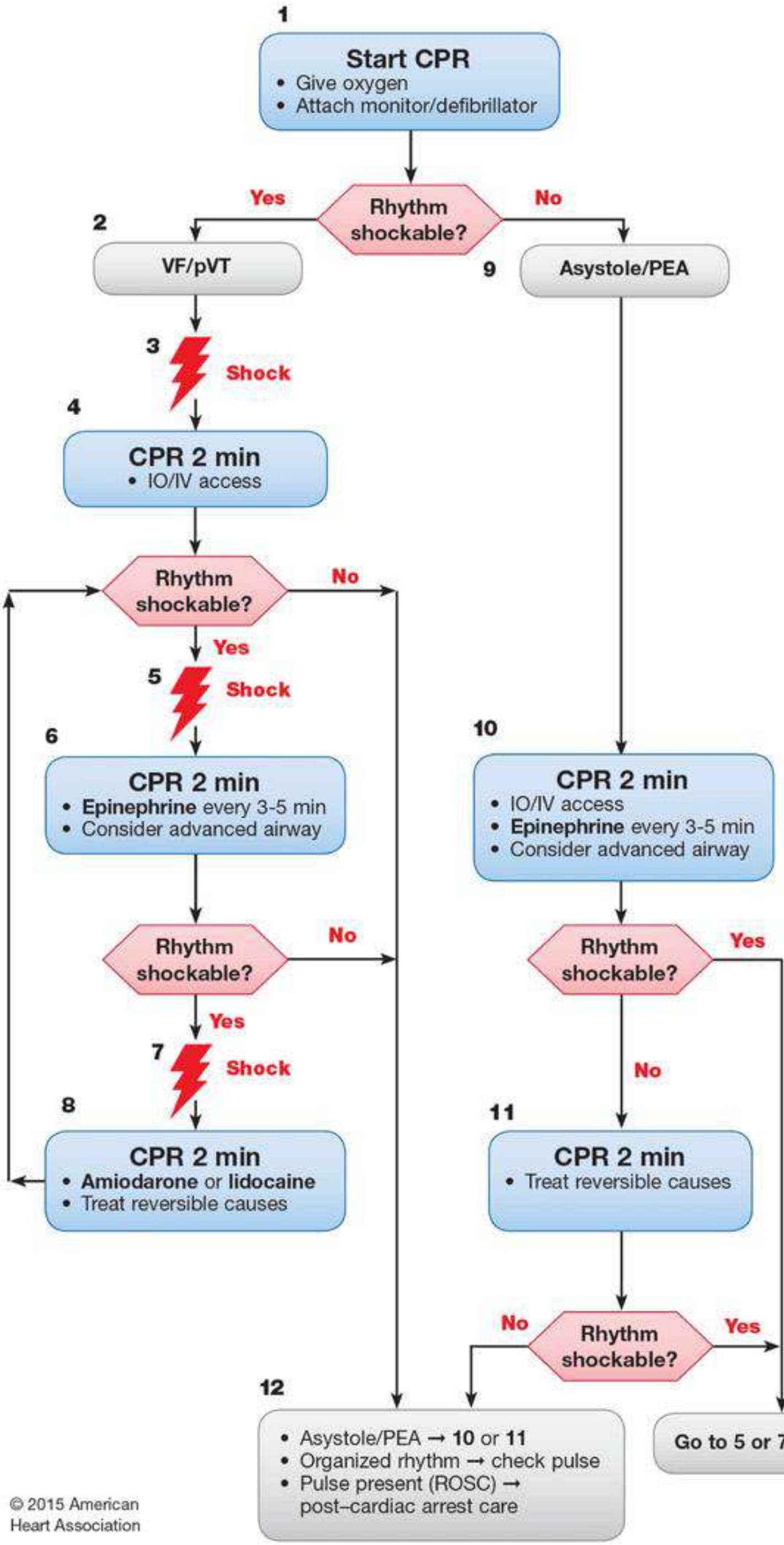
Thrombolysis can be used if PPCI is not available and the patient's condition is life-threatening.

Spontaneous coronary dissection occurs more commonly in pregnancy and can be identified and treated during PPCI. The risk of aortic dissection is also increased during pregnancy and should always be considered in the differential diagnosis of chest pain. Aortic dissection involving the coronary arteries will cause ST elevation in the relevant territory on ECG.

A 43 year old woman presents with crushing chest and back pain for one hour. She is 20 weeks' pregnant after having received IVF treatment. Thus far the pregnancy has progressed well and she has no other past history of note. On examination, heart rate is 110 bpm, blood pressure 95/60 mmHg and oxygen saturation is 92% on room air. She is pale and clammy and there are bibasal crepitations on auscultation of the lungs and the JVP is raised +3cm. The ECG shows 2mm ST elevation in leads II, III and aVF.

Which of the following is the most appropriate management?

- Admission to the Coronary Care Unit for supportive care
- Primary Percutaneous Coronary Intervention (PPCI)
- Thrombolysis for myocardial infarction
- Thrombolysis for pulmonary embolism
- Treatment dose low molecular weight heparin

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## CPR Quality

- Push hard (≥⅓ of anteroposterior diameter of chest) and fast (100-120/min) and allow complete chest recoil.
- Minimize interruptions in compressions.
- Avoid excessive ventilation.
- Rotate compressor every 2 minutes, or sooner if fatigued.
- If no advanced airway, 15:2 compression-ventilation ratio.

## Shock Energy for Defibrillation

First shock 2 J/kg, second shock 4 J/kg, subsequent shocks ≥4 J/kg, maximum 10 J/kg or adult dose

## Drug Therapy

- **Epinephrine IO/IV dose:** 0.01 mg/kg (0.1 mL/kg of 1:10 000 concentration). Repeat every 3-5 minutes.
  If no IO/IV access, may give endotracheal dose: 0.1 mg/kg (0.1 mL/kg of 1:1000 concentration).
- **Amiodarone IO/IV dose:** 5 mg/kg bolus during cardiac arrest. May repeat up to 2 times for refractory VF/pulseless VT.
- **Lidocaine IO/IV dose:** Initial: 1 mg/kg loading dose. Maintenance: 20-50 mcg/kg per minute infusion (repeat bolus dose if infusion initiated >15 minutes after initial bolus therapy).

## Advanced Airway

- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement
- Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions

## Return of Spontaneous Circulation (ROSC)

- Pulse and blood pressure
- Spontaneous arterial pressure waves with intra-arterial monitoring

## Reversible Causes

- **H**ypovolemia
- **H**ypoxia
- **H**ydrogen ion (acidosis)
- **H**ypoglycemia
- **H**ypo-/hyperkalemia
- **H**ypothermia
- **T**ension pneumothorax
- **T**amponade, cardiac
- **T**oxins
- **T**hrombosis, pulmonary
- **T**hrombosis, coronary

Peer responses

Give 1mg atropine IV — 0%

Give 5mg adrenaline IV — 5%

Give 100mg Lidocaine IV — 0%

Give 300mg amiodarone IV ✔ — 95%

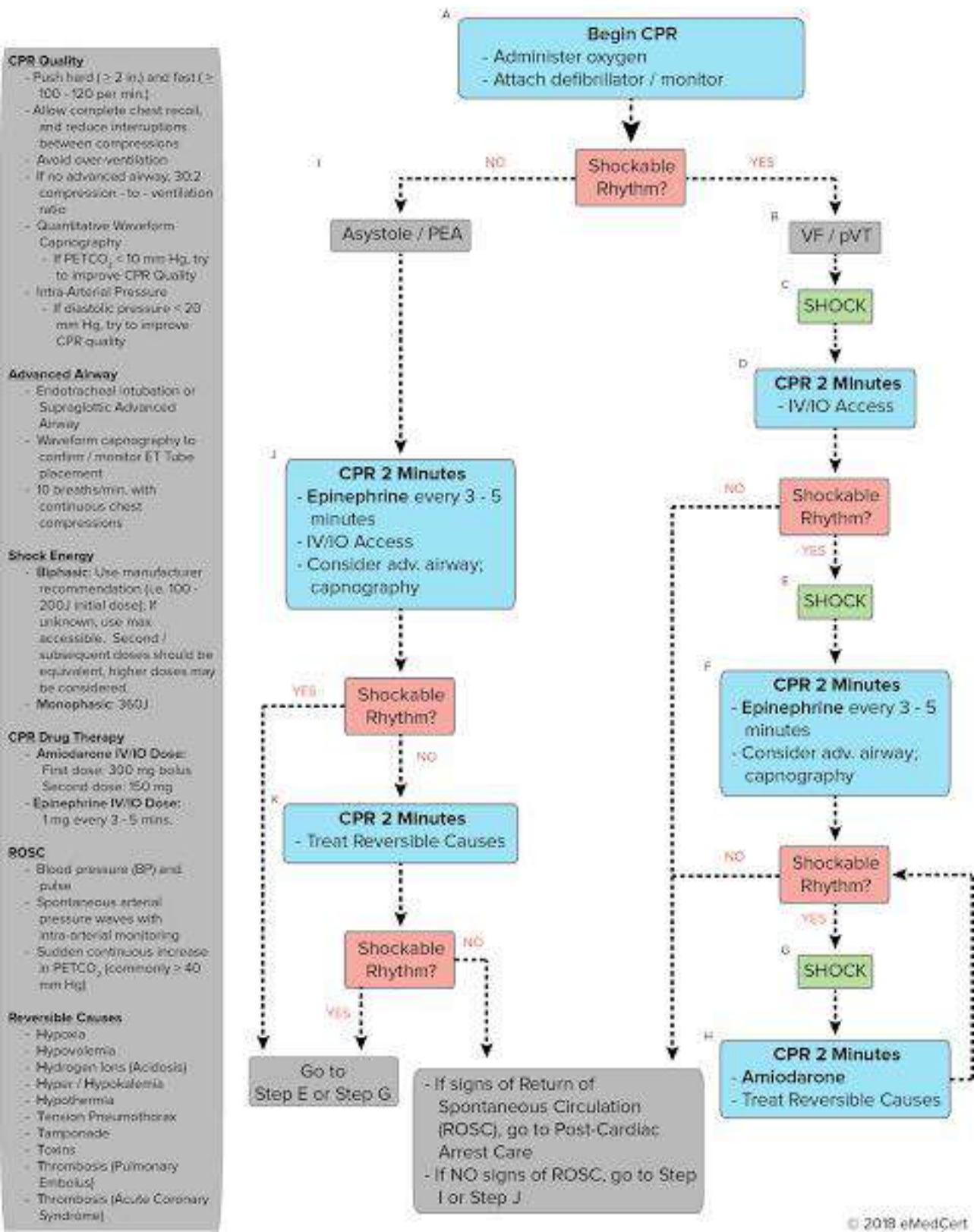
Correct answer selected

Give 2g magnesium IV — 0%

Following the third attempted defibrillation, guidelines recommend the use of 300 mg IV amiodarone and a further 150mg IV dose should be considered after a total of 5 shocks.

Ref

# Adult Cardiac Arrest Algorithm




**CPR Quality**
- Push hard ( > 2 in.) and fast ( > 100 - 120 per min.)
- Allow complete chest recoil, and reduce interruptions between compressions
- Avoid over ventilation
- If no advanced airway, 30:2 compression - to - ventilation ratio
- Quantitative Waveform Capnography
  - If $PETCO_2$ < 10 mm Hg, try to improve CPR Quality
- Intra-Arterial Pressure
  - If diastolic pressure < 20 mm Hg, try to improve CPR quality

**Advanced Airway**
- Endotracheal intubation or Supraglottic Advanced Airway
- Waveform capnography to confirm / monitor ET Tube placement
- 10 breaths/min. with continuous chest compressions

**Shock Energy**
- **Biphasic:** Use manufacturer recommendation (i.e. 100 - 200J initial dose); If unknown, use max accessible. Second / subsequent doses should be equivalent, higher doses may be considered.
- **Monophasic:** 360J

**CPR Drug Therapy**
- **Amiodarone IV/IO Dose:** First dose: 300 mg bolus Second dose: 150 mg
- **Epinephrine IV/IO Dose:** 1 mg every 3 - 5 mins.

**ROSC**
- Blood pressure (BP) and pulse
- Spontaneous arterial pressure waves with intra-arterial monitoring
- Sudden continuous increase in $PETCO_2$ (commonly > 40 mm Hg)

**Reversible Causes**
- Hypoxia
- Hypovolemia
- Hydrogen Ions (Acidosis)
- Hyper / Hypokalemia
- Hypothermia
- Tension Pneumothorax
- Tamponade
- Toxins
- Thrombosis (Pulmonary Embolus)
- Thrombosis (Acute Coronary Syndrome)

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# Adult BLS Algorithm

Establish Scene Safety

- Shout for help
- Activate emergency response system (if applicable, use mobile device)
- Get defibrillator (AED)

- Simultaneously check pulse & observe for breathing / only gasping / not breathing
- DEFINITE pulse in 10 seconds?

Has Pulse
*Not normal breathing*

Rescue Breathing - 1 breath every 5 - 6 seconds
- Pulse check every 2 minutes
- Activate emergency response system after 2 minutes
- If opioid overdose, deliver naloxone per protocol

Has Pulse
*Normal breathing*

Monitor until EMT / Responder arrival

No Pulse
*Only gasping / not breathing*

By now, emergency response system / backup is activated, defibrillator (AED) & emergency equipment available or en-route

**Initiate CPR Cycles**
30 Compressions / 2 Breaths
*Use AED immediately upon arrival*

Defibrillator (AED) arrives

Rhythm Check:
Shockable rhythm?

Non-shockable Rhythm

- Immediately resume CPR for 2 minutes
- Rhythm check every 2 minutes
- *Resume cycle until ALS providers arrive, or victim begins to move*

Shockable Rhythm

- Deliver Single Shock
- Immediately resume CPR for 2 minutes
- *Resume cycle until ALS providers arrive, or victim begins to move*

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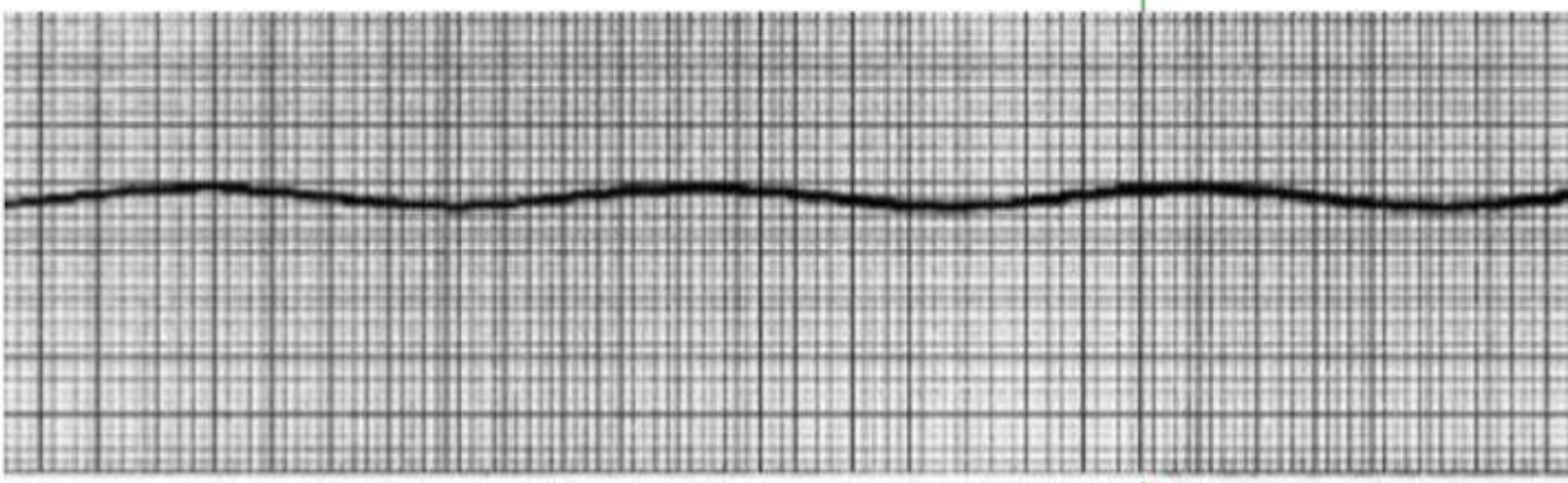
A 72 year old male with coronary artery disease is being resuscitated following a cardiac arrest. He has had a VF arrest and received 3 escalating shocks over the last 5 mins. The patient has also received adrenaline 1mg IV following the second shock. He remains pulseless in VF and continues on CPR.

Which of the following is the next step in the management of the patient?

- Give 1mg atropine IV
- Give 5mg adrenaline IV
- Give 100mg Lidocaine IV
- Give 300mg amiodarone IV
- Give 2g magnesium IV



Which of the following is the most appropriate approach to the management of this patient?

Peer responses

- Give 1mg adrenaline IV ✔ — 95%
  Correct answer selected
- Give 1mg atropine IV — 1%
- Give 300mg amiodarone IV — 0%
- Give a 150J shock from a defibrillator — 2%
- Give a 300J shock from a defibrillator — 2%

The rhythm strip reveals asystole – non-shockable rhythm. The initial treatment is adrenaline 1mg IV as soon as possible. Resuscitation in pulseless electrical activity and asystolic arrest are unlikely to be successful unless a reversible cause can be found – eg electrolyte disturbance (hyperkalaemia), tamponade, hypoxia, PE.

**Reference:**

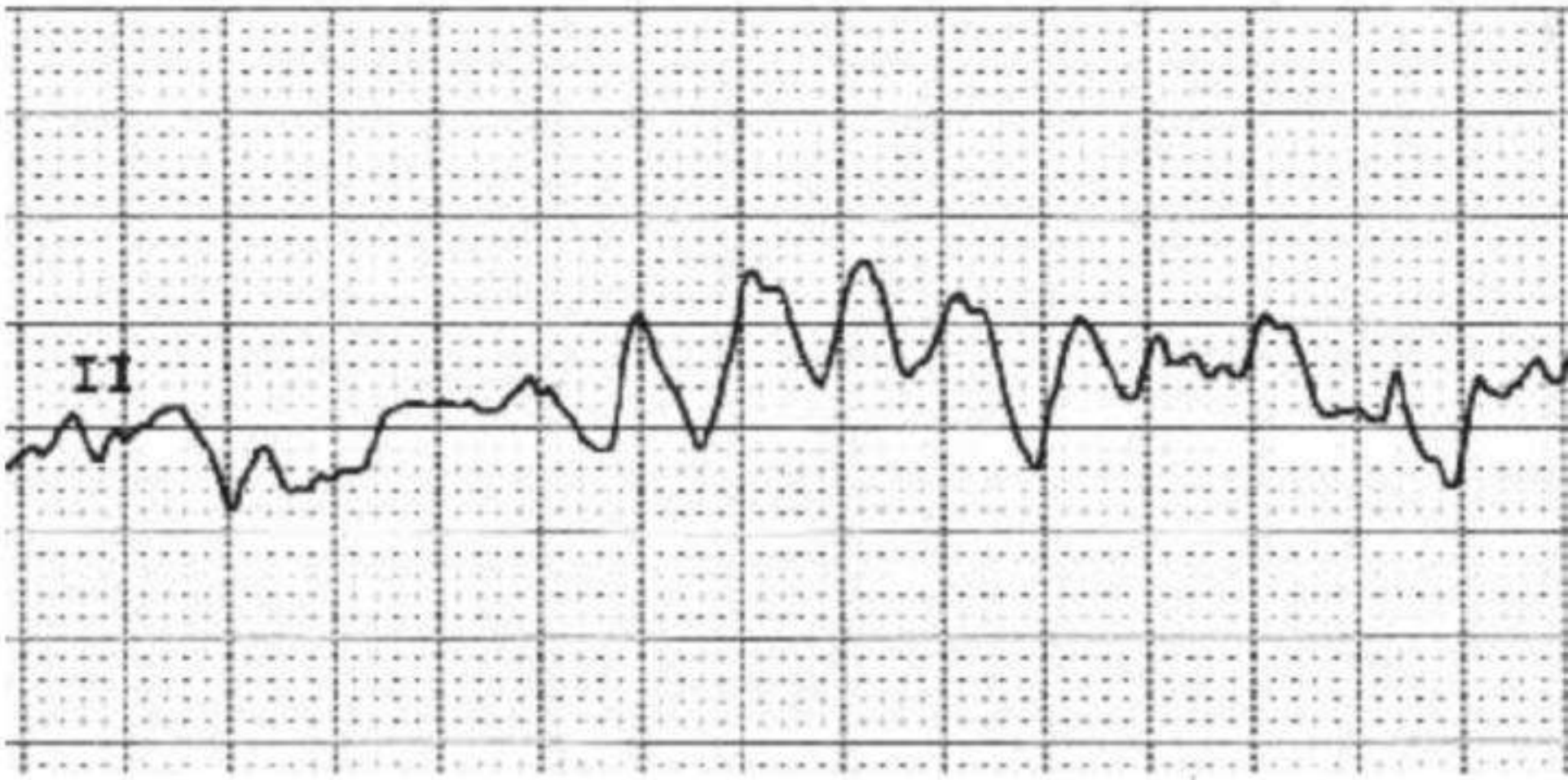
Which of the following is the most appropriate initial approach to the management of this patient?

Peer responses

| | |
|---|---|
| Give 1mg adrenaline IV | 13% |
| Give 1mg atropine IV | 0% |
| Give 300mg amiodarone IV | 0% |
| Give a 150J shock from a defibrillator ✔ Correct answer selected | 55% |
| Give a 300J shock from a defibrillator | 32% |

The rhythm strip reveals ventricular fibrillation and the initial treatment according to guidance is to give at least a 150J shock from a biphasic defibrillator. For the specialty exam one needs to be very familiar with the latest guidance on resuscitation procedure.

You are called to the arrest of a 76 year old male that was admitted with a chest infection and sepsis. The arrest call went out and on arrival the team are resuscitating at a rate of 30:2 and the anaesthetist has intubated the patient. He has a peripheral patent IV line in place. During a brief pause in resuscitation, you confirm that the patient has no pulse and the rhythm is as below:




Which of the following is the most appropriate initial approach to the management of this patient?

- Give 1mg adrenaline IV
- Give 1mg atropine IV
- Give 300mg amiodarone IV
- Give a 150J shock from a defibrillator
- Give a 300J shock from a defibrillator

Cardiac arrhythmia ✖ Incorrect 18%

answer selected

Hypokalaemia 11%

Pulmonary embolism 0%

Severe bronchospasm and mucus plugging ← Correct answer 50%

Tension pneumothorax 20%

Asphyxia due to bronchospasm and mucus plugging is the most common cause of asthma related death. Hypoxia driven arrhythmia is another common fatal complication. Salbutamol can cause hypokalaemia and other drugs used in treatment of asthma such as Aminophylline and Magnesium Sulphate can cause arrhythmia and necessitate cardiac monitoring. Tension pneumothorax should be considered, and may be bilateral.

A 25 year old asthmatic woman presents with increasing dyspnoea and wheeze over 3 days, requiring repeated doses of salbutamol. On examination, she is struggling to complete sentences. Heart rate is 130 bpm, blood pressure 100/60 mmHg, respiratory rate is 36 breaths/min, oxygen saturation is 80% on room air. On auscultation the chest is silent. While receiving continuous nebulised Salbutamol, she suddenly arrests.

Which of the following is the most likely cause of her arrest?

- Cardiac arrhythmia
- Hypokalaemia
- Pulmonary embolism
- Severe bronchospasm and mucus plugging
- Tension pneumothorax

- 0.5 mg adrenaline IV — 3%
- 0.5 mg adrenaline IM ✔ Correct — 87%

answer selected

- 10mg chlorpheniramine IM — 4%
- 100mg hydrocortisone IV — 7%
- 40mg oral prednisolone — 0%

This patient has developed angioedema, urticarial and breathing difficulties typical of anaphylaxis. The patient should be treated with 0.5 mg IM adrenaline as the initial treatment as per the resuscitation council guidelines. Other treatments include IM/IV hydrocortisone and IM chlorpheniramine but the IM adrenaline and fluids is the initial treatment. The use of IV adrenaline is reserved for severe cases in whom expert understanding of IV adrenaline is understood.

# Acute Medicine SCE Revision Cardiorespiratory arrest and shock

Question ID #3771

An 18 year old female is admitted as an emergency with acute facial swelling and difficulty breathing. She is not known to have any allergy but does suffer from mild asthma for which she occasionally uses a salbutamol inhaler. She was out having a picnic with her friends, eating various foods, when she suddenly became unwell, feeling particularly anxious and itchy, while developing facial/mouth swelling with difficulty breathing. Her friends called 999.

On examination, she has swelling of the face particularly around the eyes and lips. There are wheals around the neck. Pulse is 100 bpm and blood pressure 128/80 mmHg. She has an audible wheeze and oxygen saturations are 96% on air.

Which of the following is the most appropriate treatment for this patient?

- 0.5 mg adrenaline IV
- 0.5 mg adrenaline IM
- 10mg chlorpheniramine IM
- 100mg hydrocortisone IV
- 40mg oral prednisolone

Ufone 11:19 PM 100%
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| Category | Total |
|---|---|
| Cancer and palliative care and haematology | 38 |
| Cardiorespiratory arrest and shock | 11 |
| Cardiovascular medicine | 18 |
| Clinical pharmacology & poisoning | 36 |
| Diabetes and endocrine medicine | 29 |
| Gastroenterology and hepatology | 49 |
| Infectious diseases | 22 |
| Medicine in the elderly | 16 |
| Musculoskeletal system | 29 |
| Neurology and ophthalmology | 39 |
| Renal medicine | 19 |
| Respiratory medicine | 28 |
| Other | 23 |
| **Total:** | **285** |

| | | |
|---|---|---|
| ○ | Chemotherapy | 4% |
| ○ | Endobronchial brachytherapy | 1% |
| ○ | Radiotherapy | 28% |
| ◉ | Stent placement ✔ Correct answer selected | 66% |
| ○ | Thrombolytic drugs | 0% |

NICE guidance (March 2016) advise stenting as the 1st line option for patients with NSCLC as it gives faster relief or symptoms (95% in 48hrs) and is better tolerated than other treatments. After stenting patients may be referred for radiotherapy or chemotherapy if appropriate.

**Reference:**

Lung cancer: diagnosis and management Clinical guideline [CG121] Published date: April 2011.

A 55 year old man with locally advanced non-small cell lung cancer (NSCLC) is admitted to the hospice with a one week history of progressive arm and facial swelling, facial plethora and shortness of breath. Symptoms, signs and chest X ray suggest the diagnosis is Superior Vena Caval obstruction secondary to mediastinal compression by the tumour and you commence the patient on high dose dexamethasone and symptomatic treatment.

What is the next best active treatment option?

- Chemotherapy
- Endobronchial brachytherapy
- Radiotherapy
- Stent placement
- Thrombolytic drugs

Ufone 10:41 PM 100%
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Intravenous rehydration with 0.9% Saline ✔ Correct answer selected 93%

IV zolendronic acid (4mg) infusion 4%

IV Disodium pamidronate (60mg) infusion 0%

Oral 8mg dexamethasone 3%

Rehydration should initially precede use of a bisphoshonate in acute presentations Choice of IV bisphosphonate for treatment of hypercalcaemia is often dictated by local policy but zolendronic acid is more effective at restoring normocalcaemia than ibandronic acid and disodium pamidronate Corticosteroids are no longer recommended in the management of the hypercalcaemia of malignancy because of poor response rate but may occasionally be used as an adjunct to calcitonin. There are case reports supporting the use of octreotide in the treatment of hypercalcaemia associated with neuroendocrine tumours.

A 65 year old male, known to have non-small cell lung cancer with metastases to the bones and liver, is admitted on the acute medical take with confusion, constipation and a history of falls at home.

His biochemistry results on admission are:

| | |
|---|---|
| **Sodium** | 132 mmol/L (134-144) |
| **Potassium** | 4.2 mmol/L (3.5-5) |
| **Urea** | 8.3 mmol/L (3-8) |
| **Creatinine** | 109 µmol/L (50-100) |
| **Corrected Calcium** | 3.12mmol/L (2.2-2.5) |
| **Phosphate** | 0.8mmol/l (0.8-1.4) |

What is the recommended initial course of action?

- ○ Bolus octreotide injection given subcutaneously
- ○ Intravenous rehydration with 0.9% Saline
- ○ IV zolendronic acid (4mg) infusion
- ○ IV Disodium pamidronate (60mg) infusion
- ○ Oral 8mg dexamethasone

Ufone 10:27 PM 100%
studyprn.com

Peer responses

IM adrenaline ✔ Correct answer selected 95%

IV adrenaline 2%

IM chlorpheniramine 0%

IV Hydrocortisone 2%

No treatment needed other than careful observation 0%

This patient is likely to have developed a severe allergic reaction as evidenced by the swelling and rash but more worryingly there are also features of anaphylaxis, as evidenced by the difficulty breathing and wheeze. He requires urgent treatment and the acknowledged first line treatment for anaphylaxis is IM adrenaline which is typically administered via an adrenaline autoinjector

Adjuvant therapies that can be given include high flow oxygen , IV fluids, nebulised bronchodilators, corticosteroids and antihistamines . IV adrenaline is not recommended as a first line agent and should only be given by experienced specialists.

A 76 year old male who is being treated for renal cell carcinoma and has just received trimethoprim for a urine infection. You are called to see him as within minutes of receiving the drug he developed facial swelling, light-headedness and difficulty breathing.

On immediate assessment you note that he has swelling of the lips and eyes with a widespread red blotchy rash. He is particularly wheezy, with a respiratory rate of 28/min, a pulse of 110bpm and a supine blood pressure of 100/70 mmHg.

Which of the following would be the most appropriate immediate treatment for this patient?

- IM adrenaline
- IV adrenaline
- IM chlorpheniramine
- IV Hydrocortisone
- No treatment needed other than careful observation

Commence prophylactic dose of low-molecular-weight heparin 3%

Commence treatment dose of low-molecular-weight heparin ✔ Correct answer selected 63%

Suggest the patient rebreathes into a paper bag 3%

Keep the patient comfortable and employ supportive treatment only 18%

Acute onset shortness of breath in the middle of the night in a patient with cancer (in particular brain, pancreas, ovary, lung, bladder, stomach, uterus) has to be a pulmonary embolism until proven otherwise, especially with raised RR, tachycardia and sats on the cusp of the desaturation curve. The biggest mistake is not to consider it as a possibility and to diagnose panic attack instead whereas panic attacks need to be a diagnosis of exclusion. Clearly LMWH in this scenario can also be palliative in its effect. Similarly the patient should be counselled regarding future care and the decision on resuscitation further discussed.

You are called to see a 58 year old man transferred from the hospice. He has a diagnosis of metastatic pancreatic carcinoma. He was admitted from home for control of liver capsule pain the previous day. He is currently 'for resuscitation' because when the team discussed resuscitation with him, he was very clear that he would want to be resuscitated and have 'everything done'. He has become increasingly breathless overnight.

Observations:

| | |
|---|---|
| **Blood pressure** | 110/72 mmHg |
| **Heart rate** | 106/min regular |
| **Respiratory rate** | 25/min |
| **Oxygen sats** | 93% on Air |
| **Temperature** | 37.0°C |

Clinical examination of the respiratory system finds bilateral air entry with clear lung fields. CXR is normal.

Which of the following would be the most appropriate treatment for this patient??

- ○ Commence lorazepam 0.5mg sublingually or orally for anxiety
- ○ Commence prophylactic dose of low-molecular-weight heparin
- ○ Commence treatment dose of low-molecular-weight heparin
- ○ Suggest the patient rebreathes into a paper bag
- ○ Keep the patient comfortable and employ supportive treatment only

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Start loperamide 0%

Start oral metronidazole ✔ 51%

Correct answer selected

Start oral vancomycin 19%

The patient has recently completed antibiotics for a CAP, is elderly and is at risk of C.difficile. Oral metronidazole is the first line treatment for this and guidelines advise treating with antibiotics if there is a strong clinical suspicion. There is nothing in the history to suggest this patient is very unwell at present, therefore starting vancomycin is not indicated in this clinical vignette. Obtaining an abdominal X-ray would also be appropriate but can be done after starting treatment.

Clostridia are anaerobic, spore-forming rods (bacilli). C. difficile is the most serious cause of antibiotic-associated diarrhoea and can lead to pseudomembranous colitis.

C. difficile is transmitted from person to person by the faecal-oral route. However, the organism forms large numbers of heat-resistant spores, and these are not killed by alcohol-based hand cleansers or routine cleaning of surfaces. Thus, these spores remain viable in the hospital or nursing home environment for long periods of time and, because of this, the bacteria can be cultured from almost any surface in the hospital. Once spores are ingested by a patient, they pass through the stomach unscathed because of their acid-resistance. They germinate into vegetative cells in the colon upon exposure to bile acids, and multiply.

Oral metronidazole is the drug of choice (400 mg three times a day for 10-14 days).

Oral vancomycin (125 mg four times daily) is the second-line therapy for those unresponsive to oral metronidazole and is also used in the first line in cases of moderate/severe disease.

Vancomycin must be administered orally because intravenous administration does not achieve gut lumen minimum therapeutic concentration.

Ufone 4:50 PM 70%
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Question ID #3384

You are reviewing a 70-year-old patient in the ward with severe chronic obstructive pulmonary disease (COPD) who is recovering from community acquired pneumonia (CAP). He is experiencing diarrhoea. On further questioning, he tells you it is green/brown in colour and he is opening his bowels up to 7 times a day. The FY1 has sent a stool sample to the lab. His observations are stable. Investigations reveal normal U+Es, White cell count $14x10^9$/L (3-10) with a neutrophil count of $10x10^9$/l. Abdominal examination is unremarkable. What would you advise?

- Await stool results
- Obtain abdominal X-ray
- Start loperamide
- Start oral metronidazole
- Start oral vancomycin

appropriate approach to the management of this patient?

Peer responses

- Admit from clinic and start on IV antibiotics — 77% — ✔ Correct answer selected
- Arrange ERCP — 2%
- Arrange ultrasound scan of his abdomen — 20%
- Obtain baseline bloods and inform GP that these need follow up — 0%
- Start on oral metronidazole and cefalexin — 1%

Ascending cholangitis may occur in patients with a partially obstructed or stented common bile duct. It often causes severe systemic upset and should be promptly treated with antibiotics.

It should be treated with a combination of metronidazole and a cephalosporin (cefuroxime for example). If the patient is in septic shock, a single dose of gentamicin should be given (5 mg/kg; maximum dose of 500 mg IV over 30 mins).

It is likely that this patient has a blocked stent and will require ERCP when stable.

You are reviewing a patient in clinic with a 12 month history of cholangiocarcinoma. He has a biliary stent in situ for 3 months with good symptomatic relief of jaundice and pruritus. He has felt unwell for 24 hours with nausea, sweats and malaise. On examination, has a temperature of 38.6°C, a pulse of 82 bpm regular and a blood pressure of 136/80 mmHg. Examination of the abdomen reveals tenderness over his right upper quadrant.

Which of the following would be the most appropriate approach to the management of this patient?

- ○ Admit from clinic and start on IV antibiotics
- ○ Arrange ERCP
- ○ Arrange ultrasound scan of his abdomen
- ○ Obtain baseline bloods and inform GP that these need follow up
- ○ Start on oral metronidazole and cefalexin

A 65-year-old woman presented to the unit with a 2-day history of left leg pain and swelling. She had a background history of metastatic non-small cell lung cancer with cerebral metastases for which she had received cranial irradiation and was also receiving chemotherapy plus dexamethasone. The cerebral metastases were stable and she was otherwise living an independent life. On examination, general observations were fine and she was generally well. She was slightly Cushingoid and had a swollen and tender left leg. Doppler studies revealed that she had a proximal deep vein thrombosis.

Which of the following would be the most appropriate treatment for this patient's DVT?

- ○ Apixaban
- ○ Inferior vena caval filter
- ○ Initial low molecular weight heparin and warfarin
- ○ Initial unfractionated heparin and warfarin
- ○ Long term low molecular weight heparin

| | |
|---|---|
| Consider giving alteplase | 35% |
| Get an urgent bed side ECHO | 11% |
| Get further IV access | 1% |
| Give a stat dose of unfractionated heparin followed by LMWH<br>Give high flow oxygen ✖ Incorrect answer selected | 27% |
| Give high flow oxygen ← Correct answer | 25% |

The important aspect to his management is initial resuscitation of this sick patient with a likely large PE. The initial approach would always be ABC. He has a patent airway but needs oxygen, quickly followed by IV access. The clinical scenario is depicting a massive PE and step up care to HDU required with consideration of the most appropriate treatment in this patient who has had very recent surgery.

You are reviewing a 69 year old man on the ward who has had potentially curative surgery for colorectal carcinoma. The patient is 2 days post op and feeling very nauseous. Whilst the patient is on the commode, he becomes pale and breathless.

On examination, he is distressed and cyanosed with a heart rate of 110/min, blood pressure 80/40 mmHg, a respiratory rate of 30/min and his neck veins are engorged. His saturations are 86% (previously 98% on air). He already has a IVI in situ.

Which would be the most appropriate initial course of action for this patient?

- ○ Consider giving alteplase
- ○ Get an urgent bed side ECHO
- ○ Get further IV access
- ○ Give a stat dose of unfractionated heparin followed by LMWH Give high flow oxygen
- ○ Give high flow oxygen

| INR | Bleeding | Action |
|---|---|---|
| 5.0–9.0 | Standard risk | Recommend omit 1–2 doses warfarin (1C) |
| | High risk | Suggest omit 1 dose warfarin and give 1.0–2.5 mg oral vitamin K (2A) |
| >9.0 | No bleeding | Recommend holding warfarin and giving 2.5–5.0 mg oral vitamin K (1B) |
| Any | Major bleeding | Recommend holding warfarin and giving 10 mg iv vitamin K and giving FFP or PCC or rFVIIa (1C) |

# The 8th ACCP guideline for anticoagulation reversal

A 72 year old man is sent to emergency admissions after his GP found that his INR was 10, 1 day ago. He has been taking warfarin for atrial fibrillation for the last 3 years and has had no problems. His INR is maintained between 2-2.5 in general. Recently he took some antibiotics for a chest infection but has otherwise been well.

His INR on this occasion is 10.1

Which of the following is the most appropriate approach to the management of this patient?

Peer responses

| | |
|---|---|
| Stop warfarin and give IV octaplex | 7% |
| Stop warfarin and give IV vitamin K 0.5mg | 7% |
| Stop warfarin and give IV vitamin K 2mg | 18% |
| Stop warfarin and give oral vitamin K 2mg ✔ Correct answer selected | 54% |
| Stop warfarin only | 14% |

This patient has an elevated INR but no sign of haemorrhage. Therefore guidelines suggest that the patient can be managed with a dose of oral vitamin K 1-5mg and by stopping the warfarin.

Guidelines on oral anticoagulation with warfarin

A 72 year old man is sent to emergency admissions after his GP found that his INR was 10, 1 day ago. He has been taking warfarin for atrial fibrillation for the last 3 years and has had no problems. His INR is maintained between 2-2.5 in general. Recently he took some antibiotics for a chest infection but has otherwise been well.

His INR on this occasion is 10.1

Which of the following is the most appropriate approach to the management of this patient?

- ○ Stop warfarin and give IV octaplex
- ○ Stop warfarin and give IV vitamin K 0.5mg
- ○ Stop warfarin and give IV vitamin K 2mg
- ○ Stop warfarin and give oral vitamin K 2mg
- ○ Stop warfarin only

Give a dose of atenolol 25mg od 0%

Give 20mg hydrocortisone orally 0%

Give IV hydrocortisone 100mg stat ✔ Correct answer selected 94%

Measure urea and electrolytes urgently 3%

Perform a short synacthen test 2%

The history and clinical features are suggestive of an Addisonian crisis. You would expect a high potassium and lowered sodium and raised urea (secondary to hypovolaemia). A short synacthen test will confirm adrenal insufficiency but this takes time and the results would not be back in time to influence management in this patient over the weekend. The initial treatment should consist of rapid IV rehydration and IV steroids. Oral hydrocortisone may be given to manage adrenal insufficiency but not in crisis. Atenolol would only lower BP further.

You see a patient who is very unwell in the hospice during a Saturday whilst you are on call. He has a known diagnosis of lung cancer with liver, adrenal and contralateral lung metastases. He was commenced on antibiotics for a lower respiratory tract infection yesterday and today is very lethargic, dizzy and clammy. You ask the staff nurse to check his observations and she's very worried when his heart rate is recorded at 123/min and blood pressure as 77/52 mmHg.

What would be your first course of action?

- Give a dose of atenolol 25mg od
- Give 20mg hydrocortisone orally
- Give IV hydrocortisone 100mg stat
- Measure urea and electrolytes urgently
- Perform a short synacthen test

A 65 year old female develops acute facial swelling and dyspnoea following a second dose of opiates for cancer related pain. On examination, she is breathless and has angio-oedema of the face, eyes and lips. Which of the following is the most appropriate initial treatment of this patient?

Peer responses

- Epinephrine/adrenaline administered as 500 mcg i.v. — 2%
- Epinephrine/adrenaline administered as 500 mcg (0.5 mls of 1mg/ml i.e. 1:1000) i.m. ← Correct answer — 92%
- Epinephrine/adrenaline at 500 mcg 1:10,000 conc. i.v. ✖ Incorrect answer selected — 4%
- Epinephrine/adrenaline 1:5000 conc. subcut. — 1%
- Epinephrine/adrenaline 1:5000 conc. i.m. — 1%

All healthcare professionals should be aware of how to treat anaphylaxis as displayed by this patient's presentation. The MRC have developed formal guidelines on treating anaphylaxis and the most important intial therapy is IM adrenaline, often given by an autoinjector. Full guidelines on the Resuscitation Council (UK) website and more specifically on page 20 of the PDF. IV adrenaline should not be administered unless by an specialist with expertise in the delivery of adrenaline IV.

Adrenaline auto-injector ✔ 88%

Correct answer selected

Chlorpheniramine tablets 3%

IM Hydrocortisone injection pack 1%

No requirement for any medication 7%

Salbutamol inhaler device 2%

It is recommended that all patients who are admitted with diagnosed anaphylaxis should be provided with an adrenaline auto-injector and trained on its use prior to discharge. The patient should be advised to keep the auto-injector with them at all times and should also be referred to a specialist allergy clinic for follow up where this is available. The patient should also be supplied with a written emergency management plan where possible.

A 55 year old male treated for bowel carcinoma develops anaphylaxis on the ward and is successfully treated. The precipitant is unknown. He is observed overnight and discharge planned the following morning. With which of the following should the patient be provided with prior to discharge from hospital?

- Adrenaline auto-injector
- Chlorpheniramine tablets
- IM Hydrocortisone injection pack
- No requirement for any medication
- Salbutamol inhaler device

IM Calcitonin 0%

IM Denosumab 0%

IV Hydrocortisone 0%

IV N Saline – 1l over 2hrs initially 97%

✔ Correct answer selected

IV Pamidronate 2%

The most appropriate initial treatment for this patient is IV rehydration with N Saline (4-6l over 24hrs). Once rehydration is considered adequate, the patient can then be treated with IV bisphosphonates such as pamidronate, but caution needs to be exercised with the acute kidney injury. In this case the likely cause is metastatic bone disease, so regular bisphosphonate infusions may be required.

An 81 year old man is admitted following a fall at home. It was a mechanical fall but he stumbled and cracked his head. He is not sure if he passed out or not but was dazed, gashed the side of his head and called an ambulance. In his past medical history, he takes apixaban for lone atrial fibrillation.

On admission his GCS was 15, he had a laceration to his left temporal region which had now stopped bleeding. Neurological examination was normal but a CT head scan was performed and it revealed a left subdural haematoma. On coming back from CT scan, his GCS deteriorated to 12. The neurosurgeons were contacted and intend to transfer for urgent evacuation.

Which of the following should be undertaken prior to surgery?

- ○ Give fresh frozen plasma
- ○ Give IV prothrombin complex concentrate
- ○ Give IV tranexamic acid
- ○ Give IV vitamin k
- ○ No prior treatment required; patient can undergo neurosurgery

- Allopurinol 200 milligrams daily 88%
  - ✔ Correct answer selected
- Citalopram 20 milligrams daily 1%
- Diclofenac 50 milligrams three times a day 1%
- Fluconazole 200 milligrams daily 6%
- Thalidomide 200 milligrams daily 4%

Although patients with solid tumours have a small risk of acquiring tumour lysis syndrome there are still reported incidences of it occurring. The prescription of Allopurinol should be considered when any patient is going to commence chemotherapy. The administration of chemotherapy will lead to cell death and consequently the release of uric acid into the bloodstream which may result in crystallisation in the blood and consequently renal obstruction as the tubules are blocked. Allopurinol will block the formation of new uric acid as it is a xanthine oxidase inhibitor.

**Reflection:** Consider the pharmacokinetics of medication and the need to modify dosages in patients with renal impairment. This patient would be given a smaller dose of Allopurinol due to his slight renal impairment.

A 65 year old man presented to his general practitioner with a 2 month history of a productive cough, shortness of breath on exertion, some abdominal pain and weight loss. The patient had been a lifelong smoker and had a history of hypertension and mild renal impairment. Investigations including a bronchoscopy and CT (Computed Tomography) determined that he has stage 4, small cell carcinoma of the lung with metastasis in the liver. His biochemistry profile is:

| | |
|---|---|
| Sodium | 142 millimoles per litre (133-144) |
| Potassium | 3.8 millimoles per litre (3.4-5.0) |
| Urea | 10.8 millimoles per litre (2.5-7.5) |
| Creatinine | 133 micromoles per litre (70-120) |

- His physicians want to treat him with a combination of intravenous carboplatin, etoposide and gemcitabine with a view to controlling his disease progression.

What medication will the patient's physicians give him prior to his treatment commencing?

- ○ Allopurinol 200 milligrams daily
- ○ Citalopram 20 milligrams daily
- ○ Diclofenac 50 milligrams three times a day
- ○ Fluconazole 200 milligrams daily
- ○ Thalidomide 200 milligrams daily

Ufone 10:35 AM 55%
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Give IV fresh frozen plasma and vitamin k 16%

Give IV fresh frozen plasma only 3%

Give IV prothrombin complex concentrate and vitamin K ✔ Correct answer selected 52%

Give IV prothrombin complex concentrate only 19%

Give IV vitamin K only 10%

In this emergency situation requiring urgent correction of the anticoagulation to permit surgery, the patient requires an infusion of IV vitamin K (takes about 4 hrs to work) and PCC (takes about 15 mins). These newer agents provide a far better reversal of coagulation than FFP.

**Reference:**

You are the medical registrar and are asked by your surgical colleagues about a patient who requires an emergency laparotomy for an acute abdomen. The 70 year old male is treated with warfarin for atrial fibrillation and his INR is 3.5.

Which of the following do you advise?

- ○ Give IV fresh frozen plasma and vitamin k
- ○ Give IV fresh frozen plasma only
- ○ Give IV prothrombin complex concentrate and vitamin K
- ○ Give IV prothrombin complex concentrate only
- ○ Give IV vitamin K only

A 54-year-old woman was referred to the acute unit with a 3 month history of generalised muscle pain of hip and shoulder girdles with associated weakness, together with a macular rash on hands and feet. On this occasion, the GP felt it appropriate to admit her as over the last month she had been aware of a 7kg weight loss and some fever. She had no other past history of note and in general avoided contact with the medical profession as she was rather fearful of seeing doctors.

On examination, she appeared slim with a BMI of 21kg/m2 and had macular erythematous patches over the dorsal surface of the hands and feet and also had swelling over the eyelids, which appeared like purplish angioedema. There was a more proximal muscle weakness of the arms and legs and there was tenderness to palpation of the muscles of the arms, shoulder and thighs. Investigations showed:

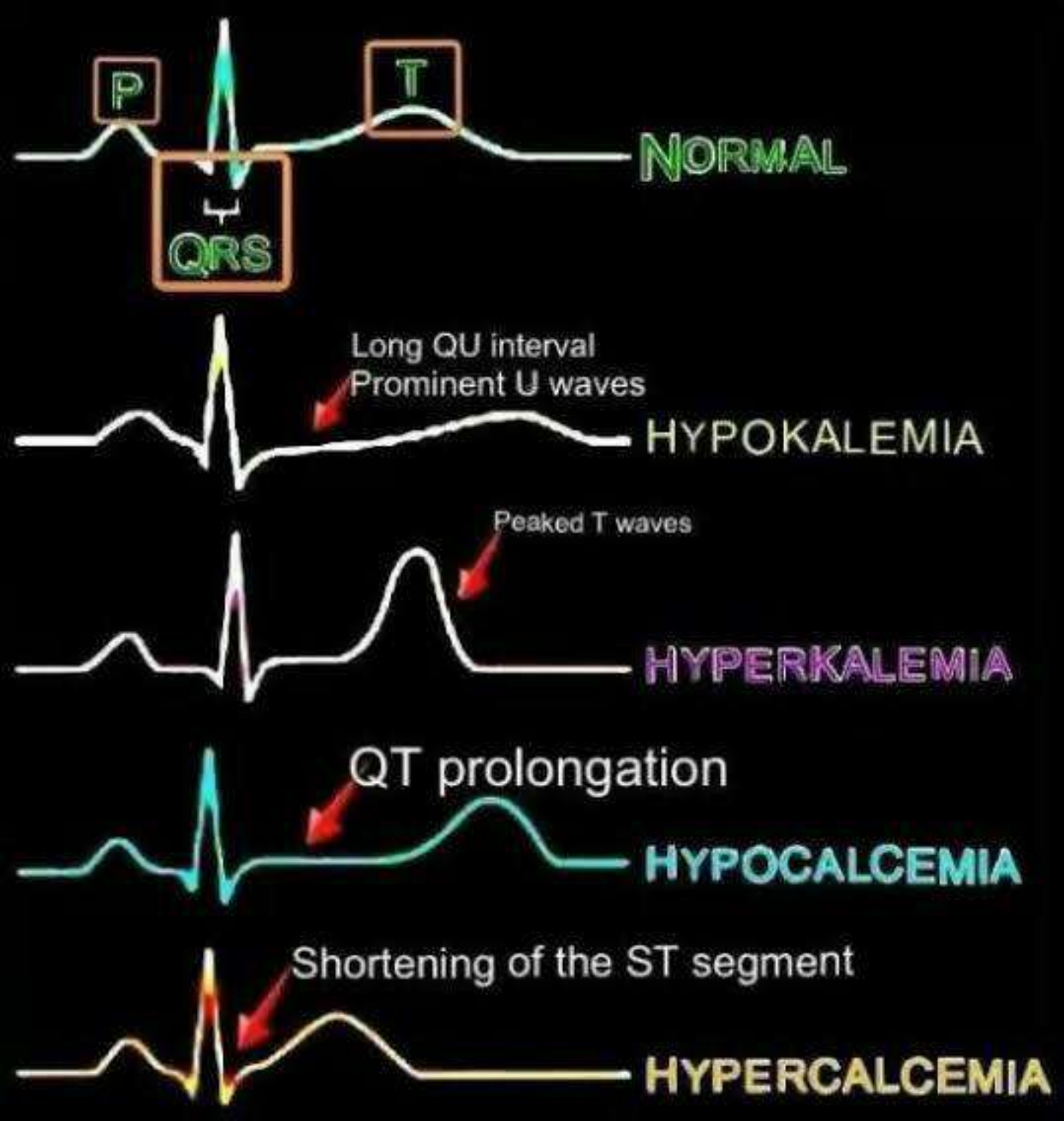
| | |
|---|---|
| FBC | Normal |
| U+Es | Normal |
| CXR | Normal |
| CRP | 121 mg/l (<5) |
| Creatine kinase | 1521 u/l (50-200) |
| AST | 450 u/l (0-50) |

Which of the following is the most likely cause for her presentation?

- ○ Hashitoxicosis
- ○ HIV infection
- ○ Illicit drug use
- ○ Ovarian cancer
- ○ Tuberculous adrenalitis

| | | |
|---|---|---|
| ○ | Prolonged PR Interval | 16% |
| ○ | QT shortening ✔ Correct answer selected | 72% |
| ○ | ST elevation | 0% |
| ○ | Tall tented T waves | 0% |
| ○ | Widened QRS complexes | 12% |

The predominant abnormality here will relate to the markedly elevated calcium, not the mild hypokalaemia. The QT interval is typically shortened in hypercalcaemia. Other features in severe hypercalcaemia include J waves and bizarre QRS appearance.


P
T
QRS
NORMAL
Long QU interval
Prominent U waves
HYPOKALEMIA
Peaked T waves
HYPERKALEMIA
QT prolongation
HYPOCALCEMIA
Shortening of the ST segment
HYPERCALCEMIA

A 62 year old woman is admitted to MAU through her GP as she has become increasingly unwell over the last few days. She is lethargic, has had occasional episodes of abdominal pain, and is clinically dehydrated. She has a recent history of metastatic breast cancer with bony involvement, for which she is receiving palliative treatment. Her results reveal:

| | |
|---|---|
| Sodium | 144 mmol/l (134-144) |
| Potassium | 3.1 mmol/l (3.5-5.5) |
| Calcium | 4.1 mmol/l (2.2-2.6) |

Which of the following would you expect to find on the ECG?

- ○ Prolonged PR Interval
- ○ QT shortening
- ○ ST elevation
- ○ Tall tented T waves
- ○ Widened QRS complexes

Large cell lung carcinoma 1%

Small cell lung cancer ✔ 64%

Correct answer selected

Squamous cell lung cancer 21%

Tuberculosis 2%

This patient has symptoms of an underlying lung cancer, supported by the mass on X-ray. His blood picture demonstrates a neuroendocrine syndrome, namely syndrome of inappropriate ADH secretion (SIADH). SIADH is most commonly associated with small cell lung cancer. Squamous cell lung cancer is more commonly associated with hypercalcaemia, whilst adenocarcinoma and large cell carcinoma are not as commonly associated with the neuroendocrine syndromes.

Although TB can present with the symptoms described, given the history and key findings, it is important to exclude a lung cancer first in this patient.

Ufone 9:19 AM 67%
studyprn.com

A 71-year-old male presents to his GP with a 3-month history of weight loss, cough and malaise. He has a 50-pack year smoking history. His GP organises a number of investigations including a chest X-ray that shows a left upper lobe mass. Some key blood test results are as follows:

| | |
|---|---|
| Haemoglobin | 14.9 g/dl (12-16) |
| White Blood Count | 6.3 (4-10) |
| Corrected Calcium | 2.58 mmol/l (2.2-2.6) |
| Potassium | 3.1 mmol/l (3.5-5) |
| Sodium | 125 mmol/l (134-144) |

Based on the investigations, what is the most likely diagnosis?

- ○ Adenocarcinoma of the lung
- ○ Large cell lung carcinoma
- ○ Small cell lung cancer
- ○ Squamous cell lung cancer
- ○ Tuberculosis

You are asked to review an 18 year old university student who is refusing to have a blood test. He has been admitted with pyrexia and vomiting. He had his first cycle of chemotherapy 7 days ago for a germ cell tumour. He is disorientated in time, place and person.

Which of the following is the most appropriate approach to this patient?

- Just treat him for neutropenic sepsis as per local protocol
- Refer to an Independent Mental Capacity Advocate (IMCA)
- Respect the patient's wishes and not take the test
- Seek permission from his next of kin
- Submit a Protection of Vulnerable Adults (POVA) application

Seek permission from his next of kin 28%

Submit a Protection of Vulnerable Adults (POVA) application 21%

ans:A

Although not ideal, this patient currently lacks capacity (the clinical history is one of probable neutropenic sepsis and confusion). Although he will require IV antibiotics, he may also have other biochemical abnormalities which will need to be investigated and if abnormal, corrected. Waiting for an IMCA may result in his death. His next of kin, although guiding on the likelihood of an acute loss of capacity, do not have any legal status in prescribing what we should or should not do.

Patients above 16 years of age are presumed to have mental capacity until shown otherwise.

Decisions regarding capacity are time and decision specific. An evaluation of capacity will normally involve discussion with the patient's family, friends, carers or an IMCA.

Loss of capacity may be temporary (as in case above).

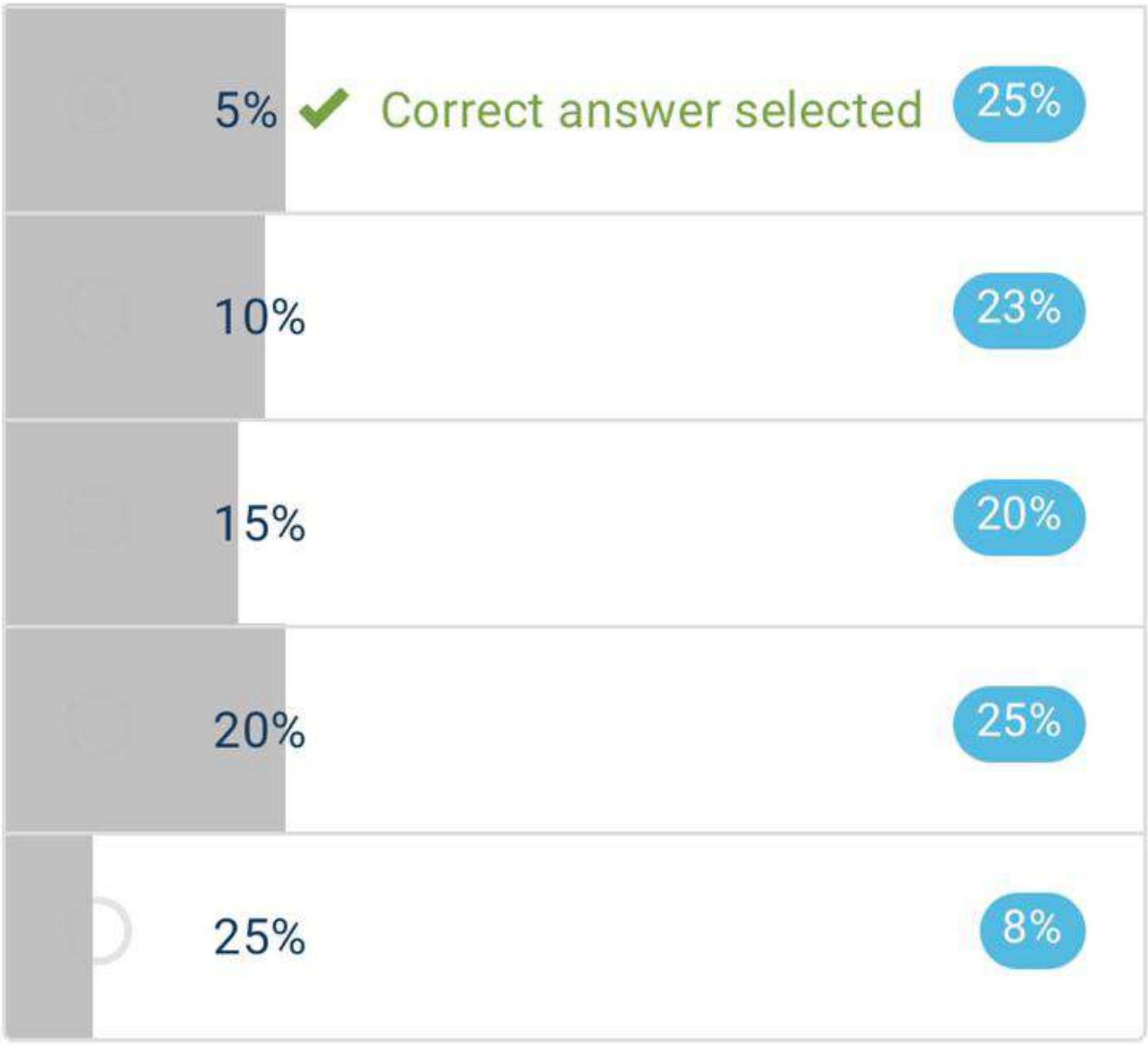
The Two-Stage Test for Capacity involves:

**Diagnostic:**

- does the patient have an impairment of the mind or brain, which means that they are unable make the decision for themselves?

**Functional:** the patient is unable to:

- Understand the information relevant to the decision, including the consequences of making or not making the decision
- Retain that information for as long as is necessary to make and communicate the decision
- Use that information as part of the decision making process
- Communicate their decision




Currently around 5% of lung cancers are cured, and although the cure rate is slowly improving it lags behind most other common cancers. Outcomes in the UK are worse than in a number of other European countries and North America. The 1-year survival is 30%. An individual's prognosis will depend on a number of variables including stage at diagnosis, histological subtype, comorbidities and performance status at diagnosis (which will also influence management options).

A 78-year-old lady with COPD is referred to the Rapid Access Chest clinic with a 5-month history of cough and weight loss. A chest X-ray requested by the GP demonstrated a lesion within the left lower lobe. A CT confirmed a likely lung primary with TNM staging T3N2M0 and biopsy shows a non-small cell lung cancer, likely squamous cell. She is referred to the oncologists for consideration of radiotherapy..

Currently, in the UK, what is the 10-year survival for lung cancer?

- 5%
- 10%
- 15%
- 20%
- 25%

There is a high risk of this patient developing tumour lysis syndrome 27%

There is a low risk of this patient developing tumour lysis syndrome ✔ 25%

Correct answer selected

There is an intermediate risk of this patient developing tumour lysis syndrome 27%

There is no risk of this patient developing tumour lysis syndrome 8%

Tumour lysis syndrome would be inevitable in this patient with this treatment strategy 13%

The patient would have a low risk of acquiring tumour lysis syndrome as Myeloma is classified by Cairo et al (2010) as being at low risk of tumour lysis syndrome. She has a low risk because she has a malignancy with a low tumour load and her renal function is normal so that her renal system will be capable of removing urate, formed from the breakdown of cell contents.

**Reflection:** Consider what about her condition or co-morbidities may make this patient change her risk category to a different one.

Arrange for her to receive hydrocortisone 50mg IV tds — 5%

Continue the dose of hydrocortisone unchanged — 4%

Double the dose of oral hydrocortisone for the duration of the illness — 85%

✔ Correct answer selected

Give her an IM injection of 100 mg hydrocortisone and continue the oral dose — 4%

Stop hydrocortisone for the duration of the illness — 2%

This patient has hypoadrenalism for which she is receiving a replacement dose of hydrocortisone which is typically 10mg bd. In order to avoid acute hypoadrenalism, patients are informed of sick day rules and should at least double the dose of steroids for the duration of the illness.

Question ID #3423

A 60 year old woman has recently been diagnosed with Myeloma with an IgM protein of 30 grams per litre (Myeloma cells usually produce a large amount of a single type of abnormal antibody (immunoglobulin), this is known as a paraprotein or M protein). She has been previous well apart from some back pain which was being managed with non steroidal anti inflammatory medication. A skeletal survey showed some deterioration in L2 and L3 in the lumbar spine and some "punched out" lesions in her pelvis. Her serum corrected calcium was 2.4 millimoles per litre (2.2-2.6), serum creatinine of 88 millimoles per litre (70-120) and haemoglobin of 132 grams per litre (120-155). A bone marrow aspiration is performed and shows 8% plasma cells. She attends the outpatients department of her local hospital with a view to her physicians commencing treatment with oral Thalidomide, Dexamethasone and Cyclophosphamide.

Which of the following best indicates her risk of developing tumour lysis syndrome?

- ○ There is a high risk of this patient developing tumour lysis syndrome
- ○ There is a low risk of this patient developing tumour lysis syndrome
- ○ There is an intermediate risk of this patient developing tumour lysis syndrome
- ○ There is no risk of this patient developing tumour lysis syndrome
- ○ Tumour lysis syndrome would be inevitable in this patient with this treatment strategy

You are called by the A&E doctor for advice. What would you advise?

Peer responses

- Recommend the patient drinks a fizzy drink ← Correct answer — 43%
- Recommend the patient drinks plenty of iced water — 14%
- Recommend the patient eats ice cream — 2%
- Recommend the patient tries eating a soft diet e.g. buttered mashed potatoes ✖ Incorrect answer selected — 20%
- Suggest they attempt the Heimlich manoeuvre — 21%

A warm or fizzy drink is most likely to unblock a blocked metal stent. It is also recommended that the patient stands up and walks around if able to, rather than lying down. If a stent is suspected of being blocked the patient should not be encouraged to eat any food until unblocked. Avoid ice/cold drinks which can alter the shape of a metal stent and cause it to move out of place. There is nothing in the history to suggest that the patient is choking and requires the Heimlich manoeuvre.

Peer responses

| | |
|---|---|
| Institute a DNA CPR despite the patient's wishes | 8% |
| Institute a scaled CPR response where CPR can be initiated at arrest without escalation of care to ITU | 19% |
| Make the patient for resuscitation in the event of an arrest | 16% |
| Obtain the family's support for DNA CPR and then institute it | 5% |
| Offer the patient a second opinion regarding CPR selected | 51% ✔ Correct answer |

A difficult situation that arises not infrequently. Guidance suggests that the doctor determines treatment and that whilst the patient wants CPR this may not be in the interests of the patient nor of the team undertaking a futile crash call. Therefore, you can order DNACPR but you should offer the patient a second opinion.

A 42 year old man with a known mid-oesophageal squamous cell carcinoma had a metal stent inserted 3 weeks ago to relieve dysphagia. He had been feeling much better since insertion and eating semi-soft diet.

He presents to the accident and emergency department on a Sunday evening with acute-onset dysphagia over the previous 8 hours. He had been out for a meal with his family earlier that day.

You are called by the A&E doctor for advice. What would you advise?

- ○ Recommend the patient drinks a fizzy drink
- ○ Recommend the patient drinks plenty of iced water
- ○ Recommend the patient eats ice cream
- ○ Recommend the patient tries eating a soft diet e.g. buttered mashed potatoes
- ○ Suggest they attempt the Heimlich manoeuvre

A 56 year old woman attends A&E feeling unwell. She has a history of metastatic breast cancer for which she is receiving palliative treatment. Her Calcium concentration is 3.8 mmol/l and she is receiving appropriate treatment. You, as a senior opinion, have a discussion with the patient, relating to resuscitation in the event of a cardiac arrest and what she would want in that circumstance. She states that she would want CPR if she were to arrest and you judge her to be competent. On a clinical level you disagree with this decision and explain to her fully what CPR entails and that she would still receive all appropriate treatment. However, she still insists that she wants CPR in an arrest situation.

Which of the following is the appropriate management for this patient concerning a DNACPR decision?

- ○ Institute a DNA CPR despite the patient's wishes
- ○ Institute a scaled CPR response where CPR can be initiated at arrest without escalation of care to ITU
- ○ Make the patient for resuscitation in the event of an arrest
- ○ Obtain the family's support for DNA CPR and then institute it
- ○ Offer the patient a second opinion regarding CPR

A 68-year-old man with a 60 pack year history presents with cough and haemoptysis. A chest X-ray shows a right hilar mass. Bronchoscopy is undertaken and biopsy confirms the diagnosis of carcinoma of bronchus. His calcium levels are 3.49 mmol/l (2.2-2.5) with a raised PTHrp concentration.

What is the most likely histological subtype for this carcinoma?

Peer responses

| | |
|---|---|
| Adenocarcinoma | 5% |
| Alveolar-cell carcinoma | 0% |
| Fibrosarcoma | 0% |
| Small cell carcinoma | 26% |
| Squamous cell carcinoma ✔ Correct answer selected | 69% |

Hypercalcaemia and elevated parathyroid hormone related peptide levels are most commonly associated with squamous cell carcinoma. Small cell carcinoma and cancers with bone metastases may be also be associated with hypercalcaemia but not with increased PTHrH levels.

You are reviewing a 45 year old female with acute dyspnoea. She has a swollen leg and is currently in the hospital being treated for neutropenic sepsis following chemotherapy for adrenal carcinoma. You are suspicious of an acute DVT and possible pulmonary embolism. Regarding investigating venous thromboembolism, which of the following is true?

- ○ A negative D-dimer test reliably excludes VTE in all patients
- ○ Blood D-dimer assay can be requested without clinical assessment
- ○ CT-PA is now the recommended initial lung imaging modality for non-massive PE
- ○ D-dimer testing should be performed in all patients with a clinical suspicion of PE
- ○ V/Q scanning can be performed in patients with cardiopulmonary disease

A 68-year-old man with a 60 pack year history presents with cough and haemoptysis. A chest X-ray shows a right hilar mass. Bronchoscopy is undertaken and biopsy confirms the diagnosis of carcinoma of bronchus. His calcium levels are 3.49 mmol/l (2.2-2.5) with a raised PTHrp concentration.

What is the most likely histological subtype for this carcinoma?

- Adenocarcinoma
- Alveolar-cell carcinoma
- Fibrosarcoma
- Small cell carcinoma
- Squamous cell carcinoma

Intravenous Sodium Bicarbonate. 0%

Oral Colchine at 500 micrograms 3 times a day 0%

Rasburicase will be administered at 200 micrograms/kilogram daily ✔ Correct answer selected 48%

Although this patient does not have a high urate level or white cell count he does have a large number of lymph nodes involved in his disease. When chemotherapy is commenced there will be the potential for the body to be overwhelmed by the lysed cell contents and for a raised serum urate.

Uric acid is not easily excreted by the humans; this is because the human body does not produce urate oxidase which facilitates the breakdown of uric acid. Urate oxidase is found in other organisms from bacteria to mammals therefore pharmaceutical companies have produced a medication from genetically modified strain of Saccharomyces cerevisiae cloned with DNA from a strain of Aspergillus flavus, this is called Rasburicase. Rasburicase is a recombinant urate oxidase which enables uric to be excreted by the renal system (Curler and Thompson, 2013). Rasburicase should be administered prior to the commencement of chemotherapy and for up to 7 days post treatment depending on the patient's serum electrolytes, renal function and clinical condition.

**Reflection:** The prescribing of Rasburicase is often constrained because of fiscal costs. Consider the physical, emotional and medical implications of treating a patient with tumour lysis syndrome as opposed to preventing the condition with use of the medication.

The medical team plan to start chemotherapy as soon in the next 24 hours. How will they try and prevent tumour lysis syndrome in this patient?

- Allopurinol 300 milligrams once a day
- Intravenous crystalloids alone
- Intravenous Sodium Bicarbonate.
- Oral Colchine at 500 micrograms 3 times a day
- Rasburicase will be administered at 200 micrograms/kilogram daily

Above knee compression stockings 6%

Commence warfarin and titrate INR to =2 1%

Insertion of a temporary IVC filter with prior platelet infusion ✔ Correct answer selected 77%

Prescribe prophylactic dose of low molecular weight heparin (LMWH) 3%

Prescribe therapeutic dose of LMWH 12%

As the patient is well enough to receive chemotherapy we must assume that she is well enough to receive treatment for her DVT. However her platelet count is < 40 (due to chemotherapy- and therefore likely to be temporary) the most appropriate management would be insertion of a temporary ivc filter. Once her platelet count is > 40-50 then it would be reasonable for her to receive prophylactic LMWH at a reduced dose. Your local haematologist should be consulted.

A 30 year old man is diagnosed with Diffuse Large B Cell Lymphoma after having a CT (Computed Tomography) scan which showed gross cervical, axillary, mediastinal and inguinal lymphadenopathy and a biopsy of an axillary lymph gland. He is having night sweats and has lost a stone in weight during the last month. A bone marrow aspiration and trephine show no disease involvement. Immunophenotyping and histopathology of the lymph gland showed it was positive for CD45 and CD20 with CD5 with a high expression of MYC (myelocytomatosis viral oncogene) with a ki fraction of 100%.

Consequently as the lymphoma involves both sides of the diaphragm and he has B symptoms he is categorised as having stage IIIB disease.

His blood cell count is:

| | |
|---|---|
| White blood cell count | $10x10^9/1$ (3.7-11) |
| Haemoglobin | 12 g/l (120-155) |
| Platelets | $180\ x10^9/1$(140-400) |

His biochemistry is:

| | |
|---|---|
| Sodium | 142 millimoles per litre (133-144) |
| Potassium | 3.8 millimoles per litre (3.4-5.0) |
| Urea | 4.8 millimoles per litre (2.5-7.5) |
| Creatinine | 80 micromoles per litre (70-120) |
| Phosphate | 0.84 millimoles per litre (0.8-1.45) |
| Calcium | 2.3 millimoles per litre (2.2-2.6 mmol/l) |
| Urate | 0.2 millimoles per litre (<0.42 mmol/l) |
| LDH | 2500 international units per unit (230-460) |

You review a 39 year old woman with a primary brain tumour who has become pancytopenic due to temozolomide chemotherapy. She has left lower leg swelling and redness. A venous doppler confirms a femoral deep vein thrombosis. Due to her brain tumour (grade 2 astrocytoma) she had limited mobility.

FBC today is:

| | |
|---|---|
| **Haemoglobin** | 10.1 g/dl (12-16) |
| **White cell count** | $2.0x10^9$/l (3-10) |
| **Neutrophils** | $1.7x10^9$/l (3-7) |
| **Platelets** | $6x10^9$/l (140-400) |

FBC 2 days ago was:

| | |
|---|---|
| **Haemoglobin** | 10.1 g/dl (12-16) |
| **White cell count** | $2.0x10^9$/l (3-10) |
| **Neutrophils** | $1.7x10^9$/l (3-7) |
| **Platelets** | $10x10^9$/l (140-400) |

Which of the following is the most appropriate immediate management of her DVT?

- ○ Above knee compression stockings
- ○ Commence warfarin and titrate INR to =2
- ○ Insertion of a temporary IVC filter with prior platelet infusion
- ○ Prescribe prophylactic dose of low molecular weight heparin (LMWH)
- ○ Prescribe therapeutic dose of LMWH

It is a derangement of electrolytes in the blood caused by administration of chemotherapy leading to tumour cell killing and release of tumour cellular content. ✔ Correct answer selected — 85%

It is a disorder associated with the breakdown of bone particularly in the jaw — 0%

It is a disorder resulting in high calcium in his blood stream — 0%

It is an endocrine disorder caused by chemotherapy attacking the tumour cells — 1%

It is a metabolic disorder caused as result of the chemotherapy — 13%

Chemotherapy is given to patients with the aim of causing tumour lysis, however in some patients with certain malignancies the rapid release of cell contents can lead to metabolic disturbances, with increase in urate concentrations, termed Tumour Lysis Syndrome. As the cancer cells break down, they release a chemical called uric acid, which is cleared from the body by the kidneys. When high numbers of cancer cells are destroyed very quickly, renal filtration of the urate is overwhelmed with resultant increase in plasma urate. This can then progress to renal failure with deranged phosphate, potassium and calcium. Tumour lysis syndrome is the term used to describe these abnormally high chemical imbalances.

**Reflection:** The aim of chemotherapy is to cause tumour lysis (death of the cell) but not to the extent to result in metabolic disturbances. Consider how you can educate your patient without unduly causing anxiety with relation to the aims of chemotherapy treatment.

http://www.macmillan.org.uk/Cancerinformation/Cancertreatmen

They inhibit osteoblastic activity 20%

They inhibit osteclastic activity 67%

✔ Correct answer selected

They stimulate osteoblastic activity 6%

They stimulate osteoclastic activity 6%

Bisphosphonates act as pyrophosphate analogues and inhibit osteoclastic activity in bone mineral and induce apoptosis. They have no effect on PTJH or parathyroid- related protein.

A 23 year old male patient is commencing chemotherapy for Hodgkin's Lymphoma. He was diagnosed with Hodgkin's Lymphoma after presenting with to his general practitioner with a swelling in his neck, general fatigue, night sweats and persistent pruritis. His general practitioner arranged for a fine needle biopsy of the lymph node in his neck and a diagnosis of Nodular Sclerosing Lymphoma was made and the patient was referred to a local haematologist for staging and treatment of his disease. A bone marrow aspiration showed no bone marrow involvement and PET (positron emission tomography) scan showed an extensive uptake of fluorodeoxyglucose in the intra parotid; occipital and multi level neck nodal groups as well as bilateral axillary and multi compartmental mediastinal nodes. The patient's haematologist decides to treat the patient with ABVD (doxorubicin, vinblastine, dacarbazine, bleomycin,) for 12 courses at 2 weekly intervals. Prior to the treatment the patient is counselled about the side effects of chemotherapy. He has read all the literature about the side effects of chemotherapy and wants you to briefly explain what tumour lysis syndrome is. Which of the following is the most appropriate explanation of this condition?

- ○ It is a derangement of electrolytes in the blood caused by administration of chemotherapy leading to tumour cell killing and release of tumour cellular content.
- ○ It is a disorder associated with the breakdown of bone particularly in the jaw
- ○ It is a disorder resulting in high calcium in his blood stream
- ○ It is an endocrine disorder caused by chemotherapy attacking the tumour cells
- ○ It is a metabolic disorder caused as result of the chemotherapy

A 56 year old lady with metastatic renal cell carcinoma is admitted with symptoms of general malaise and nausea and is noted to have corrected calcium 3.45mmol/l (2.2 - 2.6). You prescribe an intravenous bisphosphonate infusion after rehydration.

Which of the following best describes the mode of action of bisphosphonates?

- They block the effect of PTH on the renal tubules
- They inhibit osteoblastic activity
- They inhibit osteclastic activity
- They stimulate osteoblastic activity
- They stimulate osteoclastic activity

action on this patient?

Peer responses

- Ensure the patient is nursed flat and log rolled ← Correct answer — 20%
- Prescribe stat 16mg oral dexamethasone — 16%
- Prescribe stat 16mg intravenous dexamethasone ✖ Incorrect answer selected — 36%
- Refer urgently for palliative radiotherapy — 2%
- Request an urgent whole spine MRI scan — 26%

The history suggests spinal cord compression and with neurological symptoms and signs, spinal instability cannot be excluded. The patient should therefore be nursed flat in bed and log rolled as necessary until spinal stability is known. The urgent request for an MRI and commencement of steroids is also urgent but whilst these are being organised preventing further neurological deterioration should be the first action.

A 56 year old lady with metastatic renal cell carcinoma is admitted with symptoms of general malaise and nausea and is noted to have corrected calcium 3.45mmol/l (2.2 - 2.6). You prescribe an intravenous bisphosphonate infusion after rehydration.

Which of the following best describes the mode of action of bisphosphonates?

- They block the effect of PTH on the renal tubules
- They inhibit osteoblastic activity
- They inhibit osteclastic activity
- They stimulate osteoblastic activity
- They stimulate osteoclastic activity

You are asked to review a 76 year old gentleman who has cancer of the prostate and widespread bony metastases. His back pain has become much worse this morning and his legs feel weak and "wobbly". He is unable to pass urine.

On examination, he has weakness of both legs with reduced tone and brisk reflexes of the lower limbs with upgoing plantar responses. Sensation is difficult to assess but seems impaired in the lower limbs up to the waist.

What is the most appropriate immediate course of action on this patient?

- ○ Ensure the patient is nursed flat and log rolled
- ○ Prescribe stat 16mg oral dexamethasone
- ○ Prescribe stat 16mg intravenous dexamethasone
- ○ Refer urgently for palliative radiotherapy
- ○ Request an urgent whole spine MRI scan

Bony lesions at T8 and L2 causing compression of the cord and cauda equina respectively — 21%

Solitary metastasis causing cord compression at C6 ← Correct answer — 57%

The primary tumour being squamous cell carcinoma of the lung ✖ — 3%

Incorrect answer selected

The main indications for surgical decompression are : uncertain cause with no histology, radioresistant tumour e.g. sarcoma/melanoma, unstable spine, previous RT, major structural compression, cervical cord lesion, solitary vertebral metastasis.

Indications for radiotherapy: radiosensitive tumour, several levels of compression, unfit for major surgery, patient choice.

Real extra benefit of surgical decompression would seem to be for the non-ambulent patient with a single site of cord compression and a prognosis of >3 months.

Acute pulmonary oedema due to fast atrial fibrillation — 3%

Acute pulmonary oedema due to ischaemic heart disease — 0%

Atelectasis — 2%

Mitral valve prolapse — 0%

Pulmonary embolism ✔ — 95%

Correct answer selected

The features of sudden collapse associated with shock and reduced saturations in the post-operatuve period would suggest a diagnosis of large pulmonary embolism. The fact that the chest is clear would argue against a diagnosis of acute pulmonary oedema. Similarly, fast AF is a sequelae of PE. Treatment for this needs to be considered in the context of his previous surgery but thrombolysis may be required if the PE considered life threatening.

A 45 year old male with known malignancy presents to A&E with leg weakness and urinary retention. He is assessed, commenced on dexamethasone and an urgent MRI whole spine requested. Which of the below features would favour surgical decompression over radiotherapy in the management of this likely metastatic spinal cord compression.

- A performance status of 3 before development of symptoms
- A predicted prognosis of 3 months
- Bony lesions at T8 and L2 causing compression of the cord and cauda equina respectively
- Solitary metastasis causing cord compression at C6
- The primary tumour being squamous cell carcinoma of the lung

You are asked to see a patient on the ward who has recently undergone potentially curative surgery for colorectal carcinoma. The patient is 2 days post op and has been doing quite well. However, you've been asked to see the patient as he has become acutely unwell.

On examination, his temperature is 37.3°C, his saturations are 86% (previously 98% on air) with a heart rate of 115/min in atrial fibrillation and blood pressure 80/40 mmHg. His chest sounds quite clear and there is no other abnormality to find.

Which of the following is the likely diagnosis?

- ○ Acute pulmonary oedema due to fast atrial fibrillation
- ○ Acute pulmonary oedema due to ischaemic heart disease
- ○ Atelectasis
- ○ Mitral valve prolapse
- ○ Pulmonary embolism

Peer responses

| | |
|---|---|
| IV Dextrose and Insulin ✔ Correct answer selected | 90% |
| IV Dextrose alone | 0% |
| IV Hydrocortisone | 0% |
| IV Sodium Bicarbonate | 7% |
| Oral Calcium Resonium | 3% |

Hyperkalaemia is a life threatening complication of tumour lysis syndrome and needs to be treated by the use of intravenous dextrose and insulin; this will enable the potassium in the bloodstream to be shifted back into the cells. The onset of the hypocalcaemic action occurs within 15 minutes and may last at least 60 minutes, however the patient may require further administration of dextrose and insulin dependent on the serum potassium. The reduction in potassium observed ranges from 0.6 to 1.0 millimoles per litre.

If the serum potassium continues to rise the patient need to have cardiac monitoring to observe any changes in his ECG and there may be a need for haemodialysis.

**Reflection:** As the hyperkalaemia is caused by the tumour lysis syndrome consider how to manage syndrome to prevent further deterioration with this patient.

Phosphate 2.1 mmol/l, Calcium 1.9 mmol/l, Potassium 5.9 mmol/l, and Urate 0.65 mmol/l ✔ Correct answer selected 75%

Phosphate 2.1 mmol/l; Calcium 3.2 mmol/l; Potassium 2.8 mmol/l and Urate 0.35 mmol/l. 1%

The condition is classified using the Cairo-Bishop (2004) definition. This comprises of two categories Laboratory Tumour Lysis syndrome (LTS) and Clinical Tumour Lysis Syndrome (CTLS).

Laboratory Tumour Lysis syndrome (LTS) is when any two or more of the following occur within 3 days of receiving chemotherapy:

- Serum uric acid level increases by 25% or more
- Serum potassium level increases by 25% or more
- Serum phosphate level increases by 25% or more
- Serum calcium level decreases by 25% or more

This electrolyte imbalance occurs because the cytotoxic agents kill (lyse) the tumour cells, as they die they release cellular contents into the bloodstream which results in raised serum phosphate, potassium and urate and reduced calcium. The serum calcium is lower as a consequence of the raised serum phosphate, calcium binds with phosphate thus leading to a lowering of the serum calcium.

Clinical Tumour Lysis Syndrome (CTLS) develops when there is a significant rise in serum creatinine, cardiac arrhythmia, seizure and death.

**Reflection:** It is important to consider that each establishment may interpret their results differently and this needs to be considered when analysing the blood valves of patients.

In his past medical history he has been diagnosed with angina for which he is receiving Bisoprolol 2.5mg daily and Simvastatin 40mg daily. His physicians decided to treat him with Pentostatin 4mg/$m^2$ intravenously for one dose.

24 hours after the administration of the chemotherapy the following results are obtained:

| | |
|---|---|
| Sodium | 142 millimoles per litre (133-144) |
| Potassium | 6.9 millimoles per litre (3.4-5.0) |
| Urea | 11.7 millimoles per litre (2.5-7.5) |
| Creatinine | 161 micromoles per litre (70-120) |
| Phosphate | 1.69 millimoles per litre (0.8-1.45) |
| Calcium | 1.96millimoles per litre (2.2-2.6 mmol/l) |
| Urate | 0.2 millimoles per litre (<0.42 mmol/l) |
| Lactate dehydrogenase | 1754 international units per unit (230-460) |

The patient has developed peaked T waves and PR lengthening on his Electrocardiogram (ECG), which would be the most appropriate way to treat this patient? By administering

- ○ IV Dextrose and Insulin
- ○ IV Dextrose alone
- ○ IV Hydrocortisone
- ○ IV Sodium Bicarbonate
- ○ Oral Calcium Resonium

A 65 year old male patient was diagnosed with T cell Promyelocytic Leukaemia 1 year ago and was successfully treated with subcutaneous Campath at the time however he returned to the outpatient clinic recently with the following blood count. His haemoglobin was 121 g/l (120-155), white blood cell count 147.8 x $10^9$/l (3.7-11), platelets 120 x$10^9$/l (140-400). His serum biochemistry was normal with a

| | |
|---|---|
| Sodium | 142 millimoles per litre (133-144) |
| Potassium | 3.8 millimoles per litre (3.4-5.0) |
| Urea | 5.0 millimoles per litre (2.5-7.5) |
| Creatinine | 110 micromoles per litre (70-120) |
| Phosphate | 1.20 millimoles per litre (0.8-1.45) |
| Calcium | 2.3 millimoles per litre (2.2-2.6 mmol/l) |
| Urate | 0.2 millimoles per litre (<0.42 mmol/l) |
| Lactate dehydrogenase | 1754 international units per unit (230-460) |

In his past medical history he has been diagnosed with angina for which he is receiving Bisoprolol 2.5mg daily and Simvastatin 40mg daily. His physicians decided to treat him with Pentostatin 4mg/$m^2$ intravenously for one dose.

A 78 year old gentleman has a history of hypertension, two previous myocardial infarctions and last month was diagnosed with metastatic small cell lung cancer. His community nurse specialist has referred him to be admitted to the hospice for symptom control of his chest wall pain but she also suspects he may be dying. You note on admission that he has an implantable device under his skin and following review of his hospital case notes and discussion with the patient you confirm this is an implantable cardioverter defibrillator (ICD).

What would be the best management plan?

- ○ Complete DNACPR order and complete routine referral to cardiology for discussion of deactivation.
- ○ Contact the patient's cardiology team (or on-call team if OOH) to discuss appropriateness of ICD deactivation and then discuss with the patient (and family).
- ○ Explain to patient (and family) why it might be appropriate to deactivate the ICD and with the patients agreement proceed to deactivate with magnet.
- ○ Make a best interest decision to deactivate the ICD by placing a magnet over the ICD.
- ○ Manage symptoms appropriately and ensure a magnet is left by the patient's bedside for use in case ICD delivers shock therapy

Following discharge from hospital, a 77 year old woman was reviewed by her GP and found to have the following urea and electrolytes:

| | |
|---|---|
| **Sodium** | 137 mmol/L (135-145) |
| **Potassium** | 5.3 mmol/L (35.-5.0) |
| **Urea** | 5.2 mmol/L (2.5-6.7) |
| **Creatinine** | 86 µmol/L (70-150) |

She has a history of osteoarthritis, ischaemic heart disease, hypertension, and atrial fibrillation, does not smoke and drinks a glass of wine daily. She takes warfarin, bumetanide, isosorbide mononitrate, bisprolol, co-codamol, spironolactone, simvastatin and ramipril. On examination, she had a BMI of 31, a heart rate of 72 bpm irregular and a blood pressure of 130/84mmHg. Her pulse was irregularly irregular.

The GP is concerned about the results and which are confirmed on repeat and asks you about them. Interaction between which of the following drugs is most likely to be the cause of her presentation?

- ○ Co-codamol - Bumetanide
- ○ Bumetanide - ramipril
- ○ Bumetanide- spironolactone
- ○ Ramipril - spironolactone
- ○ Ramipril- Bisoprolol

| | | |
|---|---|---|
| ○ | Bumetanide - ramipril | 2% |
| ○ | Bumetanide- spironolactone | 12% |
| ✔ | Ramipril - spironolactone | 83% |

Correct answer selected

| | | |
|---|---|---|
| ○ | Ramipril- Bisoprolol | 2% |

This patient has hyperkalaemia with a potassium of 5.3 mmol/l. This is likely to be a consequence of the co-prescription of an ACE inhibitor together with spironolactone. Spironalactone is a potassium sparing diuretic. It acts on the late distal tubule in the nephron, by blocking the action of aldosterone - an aldosterone antagonist. It binds to the aldosterone dependent receptors at the sodium-potassium exchange site and causes increased amounts of sodium and water to be excreted while potassium excretion is inhibited. Consequently, the reabsorption of sodium (in exchange for potassium) is inhibited. ACE inhibitors such as lisinopril enhance this effect because of reduced levels of angiotensin II results in reduced aldosterone secretion.

A 68 year old man presents to his GP with a two week history of profound tiredness and falls. He has a history of hypertension and type 2 diabetes for which he attended a review two weeks ago, where changes to his medication were made. He is a non smoker and drinks occasionally. On examination, he is apyrexial, has a regular heart rate of 42 bpm, a blood pressure of 112/72 mmHg and a respiratory rate of 14 breaths per minute.

His ECG reveals a rate of 42 bpm with no P waves preceding the QRS complexes

What drug interaction may have caused this problem?

- Atenolol - verapamil
- Co-codamol - atorvastatin
- Gliclazide - amlodipine
- Ramipril - gliclazide
- Simvastatin - amlodipine

Atenolol - verapamil ✔ Correct 96%

answer selected

Co-codamol - atorvastatin 1%

Gliclazide - amlodipine 2%

Ramipril - gliclazide 0%

Simvastatin - amlodipine 1%

Verapamil should not be prescribed together with a β-blocker, because it can cause produce problematic hypotension, heart failure as well as precipitate bradycardia and complete heart block. The more profound reactions tend to happen with IV verapamil, but it is relatively contraindicated for use together with a β-blocker even when given by mouth. It is thought that the negative inotropic and chronotropic effects of beta blockers and verapamil combine synergistically to cause the heart failure.

IV lorazepam ✔ Correct answer 39%

selected

IV magnesium 1%

IV phenytoin 0%

IV saline drip 2%

IV sodium bicarbonate 58%

**Explanation**

Serum alkalinization with intravenous sodium bicarbonate has been the mainstay of therapy in tricyclic antidepressant (TCA)-induced cardiovascular toxicity. QRS prolongation is most often the indication for serum alkalinization in TCA toxicity.

Seizures are usually self limiting but where treatment is necessary benzodiazepines are the treatment of choice. Although some recommend the use of phenytoin, its efficacy has never been proven. Patients with decreased conscious level and respiratory depression may require intubation.

A 68 year old man presents a prescription for co-amoxiclav and paracetamol after being bitten on the hand by his pet dog. He has a history of epilepsy for which he takes sodium valproate.

Six days later he returns feeling unwell and would like to know if his medication may be the cause.

He says he has been passing very pale stools but dark urine, has abdominal pain, fever and an intense itch.

Which drug is most likely to be the cause of this man's symptoms?

- Amoxicillin
- Sodium Valproate
- Co-amoxiclav
- Paracetamol
- None of the above

Ufone 2:09 PM 15%
studyprn.com

- Amitriptyline ✔ Correct answer 91%
  selected
- Gliclazide 0%
- Lisinopril 4%
- Simvastatin 1%

This man has acute urinary retention. Tricyclic antidepressants, including amitriptyline, have anticholinergic adverse effects including dry mouth, blurred vision, constipation, urinary retention, and drowsiness. Some tolerance develops to these effects and patients should be encouraged to persevere as long as these effects are mild. Severe adverse effects, such as acute urinary retention require prompt treatment. It can be difficult and demoralising when the adverse effects of a drug manifest themselves before the beneficial ones, so it is important to know when this will happen.

It is not recommended that patients with depression take amitriptyline, since it is particularly dangerous in overdose.

At a routine GP consultation a 58 year old man had a blood pressure 158/116 mmHg.

He was advised on lifestyle modification in order to help lower his blood pressure.

On review a couple of months later, he was still hypertensive with a reading 156/112 mmHg.

The GP initiated antihypertensive medication.

Four weeks later while collecting he is admitted with abdominal pains and is noted to have marked constipation. He described the stools as hard, but normal in colour and odour. He had always taken care to eat a high fibre diet and drink plenty of fluid.

Which antihypertensive drug would be most likely to cause this man's problems?

- Bisoprolol
- Bendroflumethiazide
- Losartan
- Nifedipine
- Ramipril

You are the medical registrar and are asked by your surgical colleagues about a patient who requires an emergency laparotomy for an acute abdomen. The 70 year old male is treated with warfarin for atrial fibrillation and his INR is 3.5.

Which of the following do you advise?

- ○ Give IV fresh frozen plasma and vitamin k
- ○ Give IV fresh frozen plasma only
- ○ Give IV prothrombin complex concentrate and vitamin K
- ○ Give IV prothrombin complex concentrate only
- ○ Give IV vitamin K only

Ufone 3:40 PM 17%
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Glomerulonephritis.

Polycystic kidney disease. 0%

Renal artery stenosis ✔ Correct 95%

answer selected

This man has acute kidney injury (AKI) because he suffers from bilateral renal artery stenosis and took ACE inhibitors. Glomerular filtration rate (GFR) is usually dependent on rate of blood flow, an increase in flow results in an increased GFR. In patients with renal artery stenosis this flow is restricted. This activates the renin-angiotensin system, resulting in hypertension. It also means that GFR is dependent on angiotensin II mediated efferent arteriolar vasoconstriction. Consequently, preventing angiotensin II production with an ACE inhibitor will cause a fall in GFR and renal failure. This effect will only occur in patients with bilateral renal artery stenosis. It is important to be vigilant in prescribing ACE inhibitors to patients with any known arterial disease.

Further reading:

Merck Manuals: Lisinopril

Peer responses

| | | |
|---|---|---|
| | Minocycline | 38% |
| | Microgynon ← Correct answer | 23% |
| ○ | Montelukast | 2% |
| ○ | Inhaled beclomethasone | 0% |
| ○ | Sarcoidosis ✖ Incorrect answer selected | 37% |

This is a description of erythema nodosum, which is a symptom of several diseases, and an adverse reaction to various drugs, including the oral contraceptive pill. The patient may prefer to rely on barrier contraception, though in this case it is important that she does not become pregnant whilst taking a retinoid (isotretinoin). It may therefore be worth experimenting with other oral contraception or a long-acting reversible contraceptive (LARC) method. Erythema nodosum will take weeks to disappear even after the cause is removed, so patients may require symptomatic relief in the form of non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen or diclofenac.

Further reading:

A 36 year old woman was admitted to hospital with marked agitation. She had taken an overdose of Citalopram, at least 20 tablets of 20mg per tablet about 6 hours prior to admission.

On examination, she was confused and agitated. Her pulse was 110 bpm regular, blood pressure 130/80 mmHg and her temperature was 38.5C. She was noted to have hyperreflexia.

The patient was treated with IV fluids. Which of the following would be the approach to managing this patient?

- IV Diazepam
- IV Propranolol
- IV/IM Chlorpromazine
- IV/IM Haloperidol
- Sedation and intubation

- IV Diazepam ✔ Correct answer selected — 77%
- IV Propranolol — 1%
- IV/IM Chlorpromazine — 12%
- IV/IM Haloperidol — 4%
- Sedation and intubation — 6%

This patient has serotonin syndrome associated with a SSRI overdose. The condition is life threatening and this patient requires specific treatment which is supportive with IV fluids as well as moderate sedation with benzodiazepines in this case. It is suggested that drugs with anticholinergic side effects such as haloperidol and chlorpromazine should be avoided due to the effect of reducing sweating. Similarly beta blockers are contra-indicated.

Ufone 4:50 PM 59%
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Stop the NAC infusion and switch to oral methionine 8%

Stop the NAC infusion briefly and re-start at a slower rate 10%

Stop the NAC infusion, do not restart due to risk of anaphylaxis and request dialysis 9%

Stop the NAC infusion, give antihistamines and recommence infusion at slower rate ✔ Correct answer selected 58%

Adverse effects with flushing, redness and itch are common side effects associated with NAC occurring in roughly 15% of patients. However, the risk of hepatotoxicity is high in this person's case and the small risk of anaphylaxis is outweighed by the risk of hepatotoxicity if one does not give the treatment. The recommended approach is to briefly stop the NAC, give antihistamines and restart the infusion at a slower rate.

Reference:

A 26-year-old man is admitted after taking 15 g paracetamol about 6-8 hrs previously together with alcohol. He has a history of depression and left a note stating that he wanted to kill himself. He was commenced on IV N-acetylcysteine (NAC).

Plasma paracetamol concentration 90 mg/l (nomogram >70 to merit treatment at 6 hrs)

About 30 minutes into the NAC infusion, the patient becomes rather red and is aware of pruritus. What should be done?

- ○ Continue the NAC infusion at a slower rate
- ○ Stop the NAC infusion and switch to oral methionine
- ○ Stop the NAC infusion briefly and re-start at a slower rate
- ○ Stop the NAC infusion, do not restart due to risk of anaphylaxis and request dialysis
- ○ Stop the NAC infusion, give antihistamines and recommence infusion at slower rate

Ufone 6:09 PM 91%
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| | | |
|---|---|---|
| ○ | Lisinopril | 0% |
| ○ | Phenytoin ✔ Correct answer selected | 99% |
| ○ | Simvastatin | 0% |
| ○ | None of the above | 0% |

Phenytoin, along with calcium channel blockers and cyclosporine, causes gingival hyperplasia. It is often asymptomatic, though patients with poor dental hygiene may report pain and bleeding on tooth brushing and in extreme cases displacement of the teeth and periodontal disease has been reported. It is obviously the role of the dentist to educate on the matter of dental hygiene, though it does not hurt to make sure that this occurs. The patient will need to have her medication changed at the neurology clinic.

Further Reading:

A 66 year old female presents as her GP is concerned about her INR which is now 6. She has taken warfarin for approximately 2 years as anticoagulation for atrial fibrillation with the INR kept around 2.5 on a dose of 3-4 mg of warfarin daily. Her only other treatment includes losartan and amlodipine for hypertension.

On this occasion, her INR is 6.2. On further discussion, she informs you that she has most recently embarked on lifestyle and dietary changes. Which of the following products is likely to be responsible for this change in INR?

- Cranberry juice
- Fish oil tablets
- Garlic tablets
- Grapefruit juice
- Vitamin C tablets

A 56 year old woman developed a subdural haematoma following a road traffic accident. It was surgically repaired and she made a good recovery. Her medication at discharge consisted of lisinopril, bendroflumethiazide, simvastatin and phenytoin.

Three months later she re-attends the acute clinic and informs you that her dentist said that she had something called 'gingival hyperplasia'.

Which drug is likely to have caused this?

- Bendroflumethiazide
- Lisinopril
- Phenytoin
- Simvastatin
- None of the above

| | |
|---|---|
| Cranberry juice ✔ Correct answer selected | 32% |
| Fish oil tablets | 2% |
| Garlic tablets | 1% |
| Grapefruit juice | 64% |
| Vitamin C tablets | 0% |

There is some evidence to suggest that cranberry juice enhances the anticoagulant effect of warfarin. It is important to recall that many patients take cranberry juice as prophylaxis against urinary tract infection. It is also taken by some for the flavinoids ('antioxidants') that it contains, which are thought to reduce the risk of developing various malignancies. Unfortunately, they are also known to inhibit cytochrome P450 enzymes. Warfarin is predominantly metabolised by P450 CYP2C9 and if this is inhibited, the INR will obviously rise.

Patients taking warfarin should avoid cranberry juice, at least until more is known about this potential interaction. It should be noted, however, that the potential interaction was observed in a patient who had consumed extremely large quantities of cranberry juice and very little else for several days. Consumed in moderation, the juice is probably unlikely to interfere with warfarin.

Admit and monitor only 26%

Admit, monitor and give activated charcoal ✔ Correct answer selected 72%

Admit, treat with ipecac 2%

Discharge after giving activated charcoal 0%

Discharge as unlikely to have any further problems 0%

This patient has taken a potentially life threatening dose of verapamil and requires admission and monitoring. Calcium channel blocker overdose is treated very much like beta blocker overdose and, in this case, activated charcoal should be given immediately and the patient given IV fluids and monitored. If bradycardia and hypotension should develop, glucagon can be given.

An 18 year old woman is admitted as an emergency after having a row with her parents and then taking her father's tablets. She had taken a pack of 30x120mg verapamil SR, 2 hours earlier. On admission, she seemed fine and regretted taking the tablets. Her blood pressure was 110/80 mmHg and pulse was 65 bpm reg.

Which of the following is the most appropriate approach to the management of this patient?

- Admit and monitor only
- Admit, monitor and give activated charcoal
- Admit, treat with ipecac
- Discharge after giving activated charcoal
- Discharge as unlikely to have any further problems

A 20 year old woman attends the admissions unit as she is concerned about some hard, painful lumps that have developed on her shins over the last two months. She reports no other symptoms and she has a background history of asthma. She is taking salbutamol and beclomethasone inhalers, montelukast, microgynon, and minocycline.

You look at her shins and there are multiple raised erythematous macules that have the appearance of bruises which are slightly tender and of about 5-10cm in diameter.

What is the rash the likely cause of these lesions?

- Minocycline
- Microgynon
- Montelukast
- Inhaled beclomethasone
- Sarcoidosis

A 59 year old man attended his GP surgery to review his blood pressure. As this was the third hypertensive reading the GP prescribed lisinopril.

Two weeks later, the patient calls in to the pharmacy to ask your advice as he feels unwell. He has passed very little urine in the past 18 hours and is feeling nauseous.

You signpost him urgently to the local hospital where he is diagnosed with Acute kidney injury (AKI).

What is the most likely underlying condition which was exacerbated by his new medication?

- ○ Diabetes
- ○ Lisinopril hypersensitivity.
- ○ Glomerulonephritis.
- ○ Polycystic kidney disease.
- ○ Renal artery stenosis

Give IV fresh frozen plasma and vitamin k 16%

Give IV fresh frozen plasma only 3%

Give IV prothrombin complex concentrate and vitamin K ← Correct answer 53%

Give IV prothrombin complex concentrate only ✖ Incorrect answer selected 19%

Give IV vitamin K only 10%

In this emergency situation requiring urgent correction of the anticoagulation to permit surgery, the patient requires an infusion of IV vitamin K (takes about 4 hrs to work) and PCC (takes about 15 mins). These newer agents provide a far better reversal of coagulation than FFP.

to cause this man's problems?

Peer responses

| | |
|---|---|
| Bisoprolol | 11% |
| Bendroflumethiazide | 30% |
| Losartan | 1% |
| Nifedipine ✔ Correct answer selected | 57% |
| Ramipril | 1% |

Nifedipine, along with other calcium channel blockers, is known to cause constipation. There is evidence to suggest that this is because it reduces the myoelectric response to eating. If the constipation does not resolve once it has been stopped, another cause should be sought. It is notable that this man has constipation despite a high fibre diet. Other antihypertensive medication are unlikely to cause constipation.

Further reading

Ufone 2:36 PM 11%
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| | | |
|---|---|---|
| Simvastatin | | 6% |
| Lisinopril | | 1% |
| Aspirin | | 8% |
| Metformin | ✔ Correct answer selected | 33% |
| None of the above | | 52% |

Metformin is known to cause vitamin B12 deficiency, so should always be suspected as a cause of raised MCV or megaloblastic anaemia. It is thought to inhibit vitamin B12 absorption from the ileum by affecting the calcium-dependent membrane action. When metformin is stopped, the vitamin B12 deficiency resolves; if it does not, an alternative cause must be sought. Long term metformin therapy has been known to cause a much more severe condition, with deterioration in mental state and peripheral neuropathy.

A 72 year old man presented to his GP with polydipsia, sight problems and general fatigue. He had a confirmed diagnosis of type 2 diabetes mellitus. He was prescribed metformin, simvastatin and aspirin and Lisinopril.

A few months later he is noted to have a macrocytic anaemia and the GP requests a further opinion.

Which of his medications is the most likely to be the cause of this?

- Simvastatin
- Lisinopril
- Aspirin
- Metformin
- None of the above

A 60 year old man was diagnosed with herpes zoster (shingles) and treated with aciclovir. The rash subsided but significant pain remained which was managed with co-codamol 30/500 and amitriptyline.

His regular medication consists of metformin, gliclazide, lisinopril and simvastatin. He is admitted with acute lower abdominal pain and an inability to pass urine.

Which drug has caused this man's problems?

- Acyclovir
- Amitriptyline
- Gliclazide
- Lisinopril
- Simvastatin

| | |
|---|---|
| Sodium Valproate | 10% |
| Co-amoxiclav ✔ Correct answer selected | 81% |
| Paracetamol | 1% |
| None of the above | 4% |

Cholestatic jaundice can occur either during or shortly after the use of co-amoxiclav. The risk of acute liver toxicity is about 6 times greater with co-amoxiclav than with amoxicillin. Cholestatic jaundice is more common in males and in patients over the age of 65 years. Jaundice is usually self-limiting and very rarely fatal. The duration of treatment should be appropriate to the indication and should not usually exceed 14 days.

Although paracetamol overdosage is associated with liver damage, there is nothing to indicate that this patient has received an overdose.

Liver dysfunction (including fatal hepatic failure) in association with valproate, usually occurs in the first 6 months of therapy. Valproate is unlikely to be responsible for cholestatic jaundice in this patient, as he has been taking it for the last 5 years.

However, valproate is contraindicated in patients with active liver disease and treatment should be reviewed if the patient's liver dysfunction continues to deteriorate after stopping co-amoxiclav.

A 52-year-old man is found collapsed at home with an empty box of amitriptyline tablets besides him. On arrival in hospital, the patient is agitated and has a generalised tonic-clonic convulsion. Which of the following is the most appropriate initial step in his management?

- IV lorazepam
- IV magnesium
- IV phenytoin
- IV saline drip
- IV sodium bicarbonate

| | | |
|---|---|---|
| | Kumquat peel | 13% |
| | Grapefruit juice ✔ Correct answer selected | 79% |
| | Vitamin B supplements | 1% |

Statins can cause mylagia/myositis and in its most severe form, rhabdomyolysis. The most likely cause of this patient's presentation is mylagia related to statins. Many patients experience these symptoms without any drug interaction taking place.

Statins are metabolised by cytochrome P450. Grapefruit juice is known to inhibit this, resulting in increased concentrations of atorvastatin if taken concurrently. Consequently, there is a greater risk of adverse reactions such as myositis.

The patient should be advised to stop drinking grapefruit juice immediately, and temporarily, to stop the atorvastatin. He or she can be reassured that the benefit conferred by statins is greater than that of taking grapefruit juice, assuming that the patient has some other source of vitamin C. Other citrus juices are not reported to cause this effect and are safe to take. This illustrates the importance of understanding the pharmacological effects of common foods.

Further reading

A 55 year old female presents with nausea, vomiting, headache and sweating.

On examination, she is apyrexial, has a heart rate of 98bpm, a blood pressure of 138/90mmHg and a respiratory rate of 18.

Four months ago, she was found to have hypertension, and was prescribed ramipril and atenolol.

Three days ago, she was prescribed amoxicillin, metronidazole and omeprazole in response to a positive urea breath test.

What drug interaction may have occurred?

- ○ Alcohol - metronidazole
- ○ Amoxicillin - atenolol
- ○ Amoxicillin - ramipril
- ○ Metronidazole - omeprazole
- ○ Ramipril - omeprazole

| | |
|---|---|
| Alcohol - metronidazole ✔ Correct answer selected | 71% |
| Amoxicillin - atenolol | 3% |
| Amoxicillin - ramipril | 6% |
| Metronidazole - omeprazole | 15% |
| Ramipril - omeprazole | 5% |

Metronidazole can cause the disulfiram reaction when taken with alcohol.

Alcohol is metabolised by the enzyme alcohol dehydrogenase, to acetaldehyde. Acetaldehyde is further metabolised by acetaldehyde dehydrogenase; both metronidazole and disulfiram inhibit this enzyme therefore acetaldehyde accumulates. Unfortunately, acetaldehyde produces the rather unpleasant symptoms described above. For most, overindulging significantly is required before achieving a relatively mild hangover, but if alcohol is consumed even in small quantities while a patient is taking metronidazole, they will rapidly experience severe symptoms. Therefore, it is important to warn patients not to drink alcohol whilst taking it.

This effect is utilised deliberately in disulfiram therapy, which alcoholics take to overcome the temptation to drink.

A 62 year old woman is referred to the medical intake with tingling and paraesthesia. The patient has been aware of deteriorating symptoms for one week. The GP asks whether this is a stroke. She has a background history of type 2 diabetes, hypertension and GORD for which she takes omeprazole, metformin, sitagliptin, simvastatin, Ramipril and amlodipine. On examination there is little of note.

Investigations reveal:

| | |
|---|---|
| Calcium | 2.06 mmol/l (2.2-2.6) |
| Magnesium | 0.3 mmol/l (0.7-1) |
| LFTs | Normal |

You see on the computer that a 25OHD level checked 1 month before by the GP reveals a level of 18 nmol/l (>50)

Which of the following is the likely cause of this patient's presentation?

- ○ Diabetic autonomic neuropathy
- ○ Metformin
- ○ Omeprazole
- ○ Sitagliptin
- ○ Vitamin D deficiency

A 45 year old woman with a history of depression is admitted after taking an overdose of citalopram together with consuming alcohol in a suicide attempt. Her relatives state that following an argument she went off and was found in the local park some 4 hours later, inebriated, having taken about 30x40mg citalopram tablets. On examination, she had a temperature of 39.5C, a pulse of 110 bpm reg and a blood pressure of 100/60 mmHg. She is agitated with a GCS of 15. ECG reveals a sinus tachycardia. The patient is treated with activated charcoal and IV fluids.

Which of the following is the most appropriate approach to the management of this patient?

- IV diazepam
- IV glucagon
- IV insulin/glucose
- IV metoprolol
- Supportive therapy only required

A 19-year-old man attends the Emergency Department having allegedly taken 32 x 500 mg paracetamol tablets 8 hours ago. Examination is unremarkable. His blood work is sent off and he is commenced on an intravenous infusion of N-acetylcysteine.

What is the toxic metabolite in paracetamol?

- Mercapturic acid
- N-acetyl-p-aminophenol glucuronide
- N-acetyl-p-aminophenol sulphate
- N-acetyl-p-benzoquinone imine
- Salicyluric acid

A 76 year old man has a history of mild exercise induced angina, atrial fibrillation, hypertension and type II diabetes mellitus.

He is taking pioglitazone, metformin, isosorbide mononitrate, digoxin, atorvastatin, bendroflumethiazide and warfarin.

He is admitted after presenting with increasing breathlessness, a blood pressure of 148/100 mmHg, an irregular pulse of 84 bpm and swollen ankles.

Which of the medications is most likely to have been responsible for his presentation?

- Atorvastatin
- Bendroflumethiazide
- Digoxin
- Metformin
- Pioglitazone

Bendroflumethiazide 0%

Digoxin 1%

Metformin 1%

Pioglitazone ✔ Correct answer 97%

selected

Studies suggest that approximately 5% of patients taking glitazones develop oedema which may precipitate heart failure. Oedema is often worsened with the addition of other therapies such as calcium antagonists. NICE recommends that pioglitazone should be avoided in people with heart failure, and those at risk of fracture. If used in patients taking insulin, the danger is further increased. Treatment is to stop pioglitazone and treat heart failure as usual.

Ufone 10:22 AM 53%
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A 72 year old man with a 12 year history of diabetes being treated with metformin attends as a GP admission, as he is lethargic and the GP is concerned about his persistent hyperkalaemia. His HbA1c 7.5% (<6). He also has a history of hypertension for which he takes bisoprolol 5 mg daily, amlodipine 10 mg/d, simvastatin 40mg/d and aspirin 75 mg/d.

He has been re-referred to clinic by his GP as he has been noted to have a persistent hyperkalaemia. Previously he was taking an ACE inhibitor but this was stopped one year ago.

| | |
|---|---|
| Sodium | 132 mmol/l (134-144) |
| Potassium | 5.8 mmol/l (3.5 – 5) |
| Urea | 8.8 mmol/l (3-8) |
| Creatinine | 100 micromol/l (50-100) |
| Glucose | 14.1 mmol/l (3.5-5.5) |

Which of the following is the likely cause of this man's hyperkalaemia?

- ○ Auto-immune hypoadrenalism
- ○ Bisoprolol
- ○ Chronic renal failure
- ○ Metformin
- ○ Renal artery stenosis

Losartan 0%

Metformin 0%

Omeprazole 1%

Simvastatin ✔ Correct answer 99%

selected

The presentation is suggestive of a statin-induced myositis. This occurs in approximately 5% of those treated with statins and usually presents with vague muscle aches and pains. CPK is often elevated and the patients respond to withdrawal of the offending drug. Myositis is also associated with fibrates and can be exacerbated with the concomitant use of a statin and fibrate. Alternative agents to treat hyperlipidaemia, such as ezetimibe, could be used.

| | | |
|---|---|---|
| A | Amphetamines | 10% |
| B | Cocaine | 1% |
| D | Ecstasy (MDMA) ✖ Incorrect answer selected | 21% |
| C | Ketamine | 12% |
| E | Psychedelic mushrooms ← Correct answer | 57% |

This young man has developed acute liver failure as a likely consequence of the ingestion of a hepatotoxic drug. Such drugs include psychedelic mushrooms, anti-TB therapy, anticonvulsants and paracetamol. In this case the consumption of psychedelic mushrooms may well be the precipitant of acute liver failure with psilocybin mushrooms often being confused with amatoxin mushrooms, which can produce fatal hepatotoxicity.

units at 8am and 16 units at 6pm, with dose titration as needed ✔ Correct answer selected

○ Increase empagliflozin to 25 mg od and use through PEG tube after crushing the tablets 2%

○ Keep the patient on intravenous insulin infusions as much as possible 17%

○ Start on basal insulin once a day at the end of feed 30%

○ Use short acting insulin as bolus doses if blood glucose >12 mmol/l 4%

It is not advisable to crush tablets and use via NG tube as the efficacy may be lost. JBDS advises one of the three options 1. Pre-mixed (30/70) human insulin at start and midpoint of feed. 2. Isophane insulin at start and midpoint of feed. 3. Continuation of basal insulin if already prescribed with bolus doses soluble insulin at start, 6 and 12 hours into feed as required.

| | | |
|---|---|---|
| Lactate | 2.1 mmol/l | 0.5-1 |
| Ketones (on meter) | Hi | |

Which of the following is the likely cause of her presentation?

- Diabetic ketoacidosis
- Drug-induced ketoacidosis
- Drug-induced lactic acidosis
- Sepsis with fasting ketosis
- Sepsis with mixed fasting ketosis/lactic acidosis

Drug-induced ketoacidosis ✔ 24%

Correct answer selected

Drug-induced lactic acidosis 4%

Sepsis with fasting ketosis 5%

Sepsis with mixed fasting ketosis/lactic acidosis 28%

This patient has developed a severe metabolic acidosis as suggested by the low pH and low bicarbonate with some respiratory compensation. The ketones are high which is highly relevant here, particularly as the lactate is only modestly high and does not suggest lactic acidosis. A good going lactic acidosis would be above 5. Also, the glucose is only modestly elevated. This fits the picture of a drug-induced ketoacidosis due to the SGLT-2 inhibitor, empagliflozin. Whilst a very effective diabetic medication, all SGLT-2 inhibitors have been rarely implicated in euglycaemic or modestly hyperglycaemic ketoacidosis, an effect of their mechanism of action relaying on urinary glucose excretion. Often illness, fasting and vomiting exacerbate the ketosis.

A 71-year-old woman was admitted with a two day history of increasing fatigue and decreasing level of consciousness. She had otherwise been well. She had type 2 diabetes for which she was being treated with metformin 500 mg bd, empagliflozin 10 mg daily, ramipril 10mg daily and atorvastatin 10 mg daily. On examination she had a temperature of 38C, a blood pressure of 100/70 mmHg and a pulse of 100 bpm with a respiratory rate of 28/min. Her Glasgow Coma Scale score was 12. There was nil of note on abdominal, respiratory, neurological or cardiovascular examination. Results revealed:

| Test | Result | Normal range |
|---|---|---|
| Haemoglobin | 12 g/dl | 12-16 |
| White cell count | 14.5x109/l | 3.5-10 |
| Platelet | 210x109/l | 150-400 |
| Sodium | 140 mmol/l | 134-144 |
| Potassium | 5 mmol/l | 3.5-5 |
| Creatinine | 210 micromol/l | 50-100 |
| Urea | 8.3 mmol/l | 3-8 |
| Glucose | 14.5 mmol/l | 3.5-5.5 |
| pH | 7 | 7.35-7.45 |
| Bicarbonate | 7 mmol/l | 22-28 |
| pCO2 | 1.9 kPa | 4.5-6 |
| pO2 | 14.8 kPa | 10.5-13 |
| Lactate | 2.1 mmol/l | 0.5-1 |
| Ketones (on meter) | Hi | |

A 50 year old man with type 2 diabetes treated with novomix-30 16 units BD, empagliflozin 10 mg OD and sitagliptin 100 mg OD is admitted with traumatic brain injury. He is managed in the ITU after neurosurgical intervention. He is being established on long term enteral feed through a PEG starting at 8 am in the morning and running for 16 hours. His HbA1C pre-admission was 65 mmols/mol (<60).

What advice should be given regarding his diabetes management?

- ○ Continue NovoMix 30 S.C. 16 units at 8am and 16 units at 6pm, with dose titration as needed
- ○ Increase empagliflozin to 25 mg od and use through PEG tube after crushing the tablets
- ○ Keep the patient on intravenous insulin infusions as much as possible
- ○ Start on basal insulin once a day at the end of feed
- ○ Use short acting insulin as bolus doses if blood glucose >12 mmol/l

Acute hypoadrenalism 3%

Cerebral Salt Wasting ← 23%

Correct answer

Pituitary apoplexy 1%

Syndrome of inappropriate ADH secretion ✖ Incorrect answer selected 72%

Type IV renal Tubular acidosis 0%

The most likely diagnosis in this patient with head injury who then develops acute symptomatic hyponatraemia and grossly elevated urine sodium is cerebral salt wasting. The grossly elevated urine sodium (>100) is highly suggestive as the sodium is usually less with SIADH. Similarly with SIADH, there is a dilutional element so urea and potassium typically reflect this dilution being themselves low normal in contrast to CSW where there is hypovolaemia and hence higher concentrations. Hypoadrenalism is an incorrect answer as the patient is already on a high dose of steroids – dexamethasone 4mg/d.

You are called to see a 42 year old male patient on the neurosurgical ward. He was admitted with a head injury 3 days ago which required only observation. However, he has become more confused in the last 12 hours and his most recent U+Es performed this morning reveal:

| | |
|---|---|
| Sodium | 125 mmol/l (134-144) |
| Potassium | 4.5 mmol/l (3.5-5.5) |
| Urea | 6.8 mmol/l (3-8) |
| Urine Osmolality | 620 mosmol/l |
| Urine Sodium | 125 mmol/l |

Checking through his records, the previous days his U+Es were normal. He had been allowed to eat and drink normally and had stopped IV fluids 2 days ago. He was on dexamethasone the dose of which had been reduced to 4mg daily from 8 mg daily over the last day but he was on no other treatment.

On examination, he had Glasgow Coma Scale of 15, though seemed confused with him being disorientated. Oxygen saturations were 97% on air and his blood pressure was 110/80 with a pulse of 88 bpm.

Which of the following is the most likely diagnosis?

- ○ Acute hypoadrenalism
- ○ Cerebral Salt Wasting
- ○ Pituitary apoplexy
- ○ Syndrome of inappropriate ADH secretion
- ○ Type IV renal Tubular acidosis

| | | |
|---|---|---|
| ✖ | Auto-immune hypoadrenalism<br>Incorrect answer selected | 50% |
| | Bisoprolol ← Correct answer | 11% |
| | Chronic renal failure | 14% |
| | Metformin | 8% |
| | Renal artery stenosis | 17% |

This patient has a long history of hypertension and hyperkalaemia. He has a mild hyponatraemia associated with the hyperkalaemia and the most likely diagnosis is type 4 renal tubular acidosis or hyporeninaemic hypoaldosteronism. The most likely drug to cause this is the beta blocker and this should be stopped. Other drugs implicated include ACE inhibitors and NSAIDs. At this age and in a patient that does not have other autoimmune disease (T2DM), this is unlikely to be hypoadrenalism

A 21 year old male student is brought to A+E by his friends who have been increasingly concerned about him as he took a hallucinogenic substance the day before and had a 'bad trip'. Since then, he has become confused and drowsy. They do not know what substance he took but informs you that he has taken recreational drugs before.

On examination he is drowsy with a GCS of 12, blood pressure of 112/72 mmHg and a pulse of 110 bpm. He also has a liver flap. His oxygen saturations are 99% on air. There are no specific abnormalities on neurological examination.

His blood results reveal:

| | |
|---|---|
| FBC | Normal |
| U+Es | Normal |
| CRP | 55 mg/l (<5) |
| Bilirubin | 50 micromole/l (0-18) |
| Alkaline Phosphatase | 250 IU/l (50-110) |
| AST | 1500 IU/l (10-50) |
| ALT/td> | 1500 IU/l (10-500 |

Which of the following is the likely cause for his presentation?

- Amphetamines
- Cocaine
- Ecstasy (MDMA)
- Ketamine
- Psychedelic mushrooms

A 54 year old male with a recent history of hypertension and type 2 is admitted with marked muscle pains and tiredness which have developed over the last one month and have become more profound over the last week.

He is currently taking aspirin, metformin, simvastatin, losartan, omeprazole and amlodipine as regular therapies.

Which of the following is most likely to have caused his presentation?

- Amlodipine
- Losartan
- Metformin
- Omeprazole
- Simvastatin

Mercapturic acid 12%

N-acetyl-p-aminophenol glucuronide 46%

N-acetyl-p-aminophenol sulphate 4%

N-acetyl-p-benzoquinone imine 38%

✔ Correct answer selected

Salicyluric acid 0%

Explanation

Paracetamol is primarily metabolised in the liver to glucuronide and sulphate conjugates. A small proportion is oxidised by the enzyme CYP2E1 via CYP450-dependent pathways in the liver, leading to the formation of NAPQI, the toxic intermediate metabolite. NAPQI is detoxified by conjugation with glutathione and the bound NAPQI product is excreted in urine or bile. Hepatotoxicity can occur in overdose when the glutathione is 'used up' resulting in excess NAPQI.

IV insulin/glucose 2%

IV metoprolol 4%

Supportive therapy only required 49%

SSRI overdose is quite common and usually safe, though citalopram is an exception as it may prolong the QT interval. Serotonin syndrome may develop and is associated with symptoms of anxiety, agitation, tachycardia, seizures and hyperthermia. In this case, the patient has taken a high dose of citalopram and is agitated. She has been given activated charcoal and the appropriate treatment for the agitation, which may prevent the development of seizures, is IV diazepam. Oral cyproheptadine is also an agent that has been used with some success in the treatment of SSRI overdose.

Diabetic autonomic neuropathy 4%

Metformin ✖ Incorrect answer 6%

selected

Omeprazole ← Correct answer 25%

Sitagliptin 7%

Vitamin D deficiency 58%

This patient has a hypocalcaemia associated with a severe hypomagnesaemia. This is likely due to the omeprazole, which results in increased GI magnesium losses. The hypomagnesaemia impairs the calcium sensing on the parathyroid cells; hence, this results in an induced hypoparathyroidism with hypocalcaemia. It is a good diagnosis to make but is often not appreciated.

This is not due to vitamin D deficiency as with osteomalacia the 25OHD would be lower, ALP raised and the patient would likely have a proximal myopathy.

A 62 year old woman attends A&E feeling unwell. She is lethargic, has had occasional episodes of abdominal pain and is clinically dehydrated. She has a recent history of metastatic breast cancer with bony involvement, for which she is receiving palliative treatment. Her results reveal:

| | |
|---|---|
| Sodium | 144 mmol/l (134-144) |
| Potassium | 3.3 mmol/l (3.5-5.5) |
| Urea | 10.8 mmol/l (3-8) |
| Creatinine | 255 micromol/l (50-100) |
| Calcium | 4.1 mmol/l (2.2-2.6) |

Which of the following is the most appropriate initial treatment for this patient?

- IM Calcitonin
- IM Denosumab
- IV Hydrocortisone
- IV N Saline – 1l over 2hrs initially
- IV Pamidronate

IV Hydrocortisone 0%

IV N Saline – 1l over 2hrs initially 97%

✔ Correct answer selected

IV Pamidronate 2%

The most appropriate initial treatment for this patient is IV rehydration with N Saline (4-6l over 24hrs). Once rehydration is considered adequate, the patient can then be treated with IV bisphosphonates such as pamidronate, but caution needs to be exercised with the acute kidney injury. In this case the likely cause is metastatic bone disease, so regular bisphosphonate infusions may be required.

A 20-year-old lady is admitted to A&E with abdominal pain, nausea and vomiting. She has a 5 year history of type 1 diabetes with poor adherence to her therapy. Her current insulin regimen comprises insulin glargine and Novorapid via a basal bolus regimen. On examination she is dehydrated and breathing deeply, her blood pressure is 98/66 mm/hg and her pulse is 105 bpm.

Investigations-

| | Test Results | Normal Range Examples |
|---|---|---|
| **Plasma Glucose** | 21.2 mmol/l | <7.8 |
| **pH** | 6.9 | 7.35 - 7.45 |
| **pCO2** | 3.2 kPa | 4.7 - 6 |
| **pO2** | 12.1 kPa | 9.5 - 13 |
| **Serum bicarbonate** | 5.2 mmol/l | 22 - 27 |
| **Haemoglobin** | 15.9 g/dl | 12 - 16 |
| **wCC** | 21.1 X $10^9$/L | 4 - 11 |

Which of the following is a feature of the pathophysiology of diabetic ketoacidosis?

- ○ Acetoacetate is metabolized to beta hydroxybutyrate
- ○ Acidaemia is the primary cause of intracellular potassium loss
- ○ Hepatic glucose production reaches a plateau within 4 hours of insulin withdrawal
- ○ Hepatic glucose production rises gradually over the first 6 - 8 hours following insulin withdrawal
- ○ Insulin deficiency combined with cortisol and catecholamine excess is the main cause of ketone body formation

Ufone 12:17 PM 31%
studyprn.com

Insulin deficiency combined with 41% cortisol and catecholamine excess is the main cause of ketone body formation

correct C

Diabetic ketoacidosis (DKA) is an extension of the normal fasting state. Hepatic glucose production rises rapidly over the first 2 – 4 hours following insulin withdrawal reaching a plateau after around 4 hours. These changes correlate with the initial acute rise in glucagon concentrations, with other counter-regulatory hormones being little affected initially. Basal hepatic glucose production in DKA is approximately twice that in stable diabetic patients, with a much smaller decrease in peripheral glucose utilisation. Lack of insulin causes direct stimulation of carnitine acyl CoA transferase 1 and high glucagon levels inhibit the formation of malonyl CoA, further stimulating transferase activity. Consequently there is a switch NEFA resterification to oxidation. Beta-hydroxybutyrate is produced in excess and is subsequently metabolised to acetoacetate which is detected in urine ketone analysis by dipstick testing. Glucagon levels also increase levels of carnitine further enhancing fatty acid oxidation. Cortisol and catecholamines directly stimulate lipolysis. Glucagon is of particular importance as ketone body levels rise early, with a continuous increase over 10 – 12 hours. Acidaemia, combined with hyperglycaemia and hyperglucagonaemia, promote intracellular loss of potassium. The final serum potassium concentration largely depends on the rate of urinary potassium loss. Platelet secretory activity is often increased in DKA, but aggregation decreased. Neutrophil count is also commonly raised and correlates with ketone body levels, so does not necessarily imply underlying infection.

A 60 year old woman is admitted with a history of being acutely unwell, diarrhoea and more recent confusion. She gives no other history of note and is particularly agitated on admission. Her husband informs you that she has little of note in her history but has become increasingly agitated and has lost weight over the last one month.

Examination reveals that she is confused with a GCS of 15. She has a BMI of 18 kg/m2, a pulse of 120 bpm irregular, blood pressure of 110/65 mmHg and a temperature of 38.9C. She has an obvious goitre with an audible bruit.

Results reveal:

| | |
|---|---|
| FBC | Normal |
| U+Es | Normal |
| CRP | 15 (<5) |
| ECG | Atrial fibrillation |

Which of the following is the most appropriate initial treatment for this patient?

- IV amoxicillin and metronidazole
- IV potassium Iodide
- IV propranolol
- Oral carbimazole
- Oral propylthiouracil

IV propranolol ✔ Correct answer selected — 58%

Oral carbimazole — 15%

Oral propylthiouracil — 9%

This patient appears to be developing thyroid storm as revealed by a temperature, agitation, confusion, atrial fibrillation and goitre. We are not provided with the TFTs as these will often take some time to process even if asked for acutely. In this case the IV beta-blockers would be the most appropriate approach as treatment for the atrial fibrillation and these also prevent the peripheral conversion of T4 to T3. Either oral propylthiouracil or carbimazole should be given but both will take 2 hours to have an effect on the production of thyroid hormone and of course neither will prevent the release of stored hormone. Thioamides must be given at least one hour prior to the use of iodides which do block the release of stored hormone. Also, the patient should receive IV steroids.

The best treatment to control her symptoms is:

Peer responses

| | | |
|---|---|---|
| Anti-inflammatories<br>answer selected | ✔ Correct | 58% |
| Bisoprolol | | 5% |
| Carbimazole | | 3% |
| Prednisolone | | 34% |
| Thyroidectomy | | 0% |

This is a thyroiditis. Steroids and anti-thyroid drugs are not beneficial here. Her main symptoms are pain and tenderness which should improve rapidly with anti-inflammatories. There is no evidence of tachycardia or overt hyperthyroidism upon which a non cardioselective B-blocker such as propranolol would be preferred.

A 28 year old female presents with a 3 week history of flu-like symptoms followed by severe pain in her neck. Examination reveals a mild tremor and pulse of 90 bpm reg and tenderness to palpation of a mild enlarged goiter.

Thyroid function tests reveal:

| | |
|---|---|
| Free T4 | 20.9 pmol/l (9-20) |
| Free T3 | 4.4 pmol/l (3.5-7) |
| TSH | 1.8 mu/l (0.5-4.5) |

The best treatment to control her symptoms is:

- ○ Anti-inflammatories
- ○ Bisoprolol
- ○ Carbimazole
- ○ Prednisolone
- ○ Thyroidectomy

Ufone 12:36 PM 27%
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A 21-year-old lady with a 10 year history of type 1 diabetes has a most recent Hba1c of 7.8% ( < 6) is admitted to A&E following an overdose of her basal insulin. On examination she is conscious but pale and sweaty, her blood pressure is 96/66 mmHg, her pulse is 135 beats per minute and her plasma glucose is 1.8 mmol/l.

At what plasma glucose level would you expect significant autonomic counter-regulatory responses to develop in patients with type 1 diabetes?

- ○ ≤1 mmol/l
- ○ ≤1.5 mmol/l
- ○ ≤2 mmol/l
- ○ ≤2.5 mmol/l
- ○ ≤3.5 mmol/l

Mark Skip Exit

A 55 year old female attends A_E with a one week history of sickness, lethargy and fatigue. She has a two year history of metastatic breast carcinoma. On examination, she appears dehydrated and unwell.

Her investigations reveal:

| | |
|---|---|
| **Sodium** | 148 mmol/l (134-144) |
| **Potassium** | 4.8 mmol/l (3.5-5) |
| **Urea** | 12.8 mmol/l (3-8) |
| **Creatinine** | 180 micromol/l (50-100) |
| **Calcium** | 3.8 mmol/l (2.2 - 2.6) |

Which of the following is the most appropriate initial treatment for this patient?

- ○ IV Calcitonin
- ○ IV Dextrose
- ○ IV Normal saline
- ○ IV Pamidronate
- ○ IV Prednisolone

Peer responses

24hr Urine free cortisol ✖ 6%

Incorrect answer selected

EMG 20%

Oral glucose tolerance test 7%

Thyroid function tests ← 54%

Correct answer

Vitamin D concentration 13%

This young male presents with a sudden onset of complete weakness with speedy recovery. The diagnosis suggests hypokalaemic period paralysis and one finds that the potassium is low only during the episodes of weakness. However, a form fruste of this is thyrotoxic periodic paralysis and the patient should have TFTs assessed.

A 62 year old man is admitted acutely with a week history of feeling increasingly unwell and tired. He has a history of type 2 diabetes for which he takes metformin 1g bd and gliclazide 80mg bd. His last HbA1c was 10.5% (< />

On examination he appears dehydrated and unwell. His temperature is 37C , blood pressure 116/70 mmHg and a pulse of 102 bpm. Oxygen saturation is 98% on air and he has a respiratory rate of 22/min.

Blood results reveal:

| | |
|---|---|
| Sodium | 150 mmol/l (134-144) |
| Potassium | 5.5 mmol/l (3.5-5.5) |
| Urea | 15.5 mmol/l (3-8) |
| Glucose | 24.5 mmol/l (3.5-5.5) |
| pH | 7.28 (7.35-7.45) |
| Bicarbonate | 10 mmol/l (22-28) |

Which of the following is the likely diagnosis?

- ○ Acute kidney injury associated with ACE inhibitor
- ○ Diabetic Ketoacidosis
- ○ Hyperosmolar Hyperglycaemic state
- ○ Type A lactic acidosis
- ○ Type B lactic acidosis associated with metformin

A 21 year old male presents with a sudden onset weakness and is unable to move for approximately 1 hour. He gives little other history except for losing two to three pounds in weight over the last two months. On admission to hospital, he has a pulse of 100 bpm, a blood pressure of 105/80 mmHg but he has made a full recovery and muscle strength is normal with normal reflexes and flexor plantar responses. His investigations reveal:

| | |
|---|---|
| **FBC** | Normal |
| **U+Es** | Normal |
| **LFTs** | Normal |
| **Calcium** | 2.25 mmol/l (2.2 - 2.6) |
| **Glucose** | 5.5 mmol/l (3.5 - 5.5) |

Which of the following would be an appropriate investigation for this patient?

- ○ 24hr Urine free cortisol
- ○ EMG
- ○ Oral glucose tolerance test
- ○ Thyroid function tests
- ○ Vitamin D concentration

Question ID #3530

A 52 year old female is admitted with an intracranial bleed. She undergoes clipping of an cerebral arterial aneurysm and was well the following morning. The following biochemistry are noted post-operatively: (Normal ranges Sodium 135-145, potassium 3.5 -5, Urea 3-8, Creatinine 50-100)

| | | | | |
|---|---|---|---|---|
| **Day 1** | Plasma Sodium 131 mmol/l | Potassium 3.6 mmol/l | Urea 4.5 mmol/l | Creatinine 95 µmol/L |
| **Day 2** | Plasma Sodium 126 mmol/L | Potassium 3.4 mmol/L | Urea 4.2 mmol/L | Creatinine 88 µmol/L |
| **Day 3** | Plasma Sodium 123 mmol/L | Potassium 3.5 mmol/L | Urea 5 mmol/L | Creatinine 88 µmol/L |
| **Day 4** | Plasma sodium 120 mmol/L | Potassium 3.5 mmol/L | Urea 5 mmol/L | Creatinine 88 µmol/L |

On day 4 she was commenced on a fluid restriction of 1 litre per day. The following were noted at that stage: Plasma osmollity 258 mosmol/l (275-305) urine osmolality 688 mosmol/l with urine sodium 84 mmol/l.

Which of the following is the most likely diagnosis to explain the hyponatraemia?

- ○ Cranial diabetes insipidus
- ○ Hypoadrenalism
- ○ Fluid overload
- ○ Syndrome of inappropriate ADH (SIADH)
- ○ Sick cell syndrome

Ufone 4:57 PM 68%
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150 mls of 3% hypertonic saline given over 20 mins ← Correct answer 72%

1g phenytoin IV over 30 mins 0%

1l N saline over 4 hrs ✖ 5%

Incorrect answer selected

Fluid restriction to 500 mls per day 21%

This patient appears to have developed a hyponatraemic encephalopathy associated with the severe and acute hyponatraemia. This seems likely due to either SIADH or indeed cerebral salt wasting. In this scenario, the acute development of hyponatraemia results in cerebral oedema associated with an osmotic influx of water into the brain cells and swamping of the counter – regulatory sodium-potassium pump. The resulting cerebral oedema is life threatening and manifests as headache, drowsiness, seizure and potentially death. Therefore, urgent treatment is required and guidance recommends rapid increase in sodium by approx 5 mmol/l through use of 150 ml boluses of 3% hypertonic saline.M

Steroids will not help in this scenario despite the cerebral oedema. The patient does not have hypoadrenalism as reflected by normal potassium and blood pressure.

**Reference**

| | | |
|---|---|---|
| **Ig G** | 12.1 g/L | (6.0 - 15.6 g/L) |

Serum Electrophoresis - increased alpha and beta globulins, no paraprotein detected.
Urine electrophoresis - Bence jones protein not detected

Lumbar spine X ray - Mild degenerative lumbar spondylotic changes.
Chest X Ray - Clear lung fields.

Which of the following is the most likely diagnosis?

- Infective discitis
- Lumbar spondylosis
- Multiple myeloma
- Osteoporotic fracture
- Rheumatoid vasculitis

Mark

Ufone 10:48 PM 100%
studyprn.com

| | |
|---|---|
| **Creatinine** | 140 micromol/l (50 - 100) |
| **Chloride** | 122 mmol/l (95 - 105) |
| **Fasting Plasma Glucose** | 7.8 mmol/l (3.5 - 5.6) |
| **pH** | 7.12 (7.35 - 7.45) |
| **Standard bicarbonate** | 11 mmol/l (22 - 28) |
| **pCO2** | 4.2 kPa (4.5 - 6) |
| **pO2** | 14.5 kPa (10 - 13) |
| **Lactate** | 1.2 mmol/l (0.5 - 1.5) |

Which of the following is the likely diagnosis?

- ○ Co-trimoxazole induced acidosis
- ○ Diabetic ketoacidosis
- ○ Methanol consumption
- ○ Olanzapine induced acidosis
- ○ Topiramate induced acidosis

Co-trimoxazole induced acidosis 44%

Diabetic ketoacidosis 5%

Methanol consumption ✖ 12%

Incorrect answer selected

Olanzapine induced acidosis 13%

Topiramate induced acidosis ← 26%

Correct answer

The patient has a hyperchloraemic acidosis with a normal anion gap {sodium – (bicarboinate+chloride) = 11 – NR 8-16}. In this case the normal anion gap would exclude all the typical causes as found with high anion gap – lactic acidosis, DKA, methanol etc (A useful mnemonic for high anion gap metabolic acidosis is MUDPILES). Loss of bicarbonate ions is often a cause of normal anion gap acidosis – renal tubular acidosis. In our case, Topiramate causes a type 2 RTA and loss of bicarbonate ions. Acetazolamide, fistulas, hyperparathyroidism are all capable of producing a normal anion gap acidosis.

Ufone 10:48 PM 100%
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A 44 year old male with a long history of epilepsy and associated learning difficulties was admitted as his carers felt that he was more subdued and unwell. There was little history to obtain directly although his carers stated that he was normally much brighter and communicative. He was taking Omeprazole for GORD, Thyroxine, Olanzapine, Co-codamol on a PRN basis, Topirmate and had recently been prescribed Co-trimoxazole by his GP for assumed UTI.

On examination, he appeared subdued and uncommunicative with a GCS of 15. His temperature was 37.2C, blood pressure 118/72 mmHg, pulse of 110 bpm, oxygen saturations of 98% on air and a respiratory rate of 30/min. No specific signs were noted on examination of the chest, praecordium or abdomen. No focal neurology was noted.

Investigations revealed:

| | |
|---|---|
| **FBC** | Normal |
| **Sodium** | 144 mmol/l (134 - 144) |
| **Potassium** | 3.9 mmol/l (3.5 - 5) |
| **urea** | 10.2 mmol/l (3 - 8) |

Ufone 5:06 PM 73%
studyprn.com

A 78 year old lady with rheumatoid arthritis and type 2 diabetes mellitus presents with a chesty productive cough. Her medications include Metformin 1g bd, Methotrexate 15mg weekly, Folic acid 5 mg daily, and Prednisolone 5mg od. She is treated at home for a chest infection with a one week course of amoxycillin and makes a good recovery. Six weeks later she presents with severe lower lumbar back pain and is noted to have a temperature of 37C, a pulse of 100 bpm and a blood pressure of 138/78 mmHg. She is noted to have a left foot drop and a rash over the left shin which is waxy brown-yellow in colour.

Her investigations reveal:

| | | |
|---|---|---|
| **Haemoglobin** | 12.9 g/dL | (13 - 18 g/dL) |
| **WBC** | 15.3 $x10^9$/L | (4 -11 $x10^9$/L) |
| **Neutrophils** | 12.1 x $10^9$/L | (2 - 8 $x10^9$/L) |
| **Platelets** | 514 $x10^9$/L | (150 - 400 $x10^9$/L) |
| **CRP** | 53 mg/L | (< 10 mg/L) |
| **ESR** | 74 mm/hr | (< 40 mm/hr) |
| **Ig M** | 2.4 g/L | (0.4 -2.3 g/L) |
| **Ig A** | 7.8 g/L | (0.6 -5.0 g/L) |
| **Ig G** | 12.1 g/L | (6.0 - 15.6 g/L) |

Serum Electrophoresis - increased alpha and beta globulins, no paraprotein detected.
Urine electrophoresis - Bence jones protein not detected

Lumbar spine X ray - Mild degenerative lumbar

Infective discitis ✔ Correct

answer selected

- Lumbar spondylosis 1%
- Multiple myeloma 3%
- Osteoporotic fracture 2%
- Rheumatoid vasculitis 39%

This lady has risk factors for infection - Type 2 Diabetes Mellitus and immunosuppression with methotrexate for rheumatoid arthritis. Probable haematogenous spread of infection after the recent chest infection, seems the most probable cause of the presentation, resulting in seeding of the infection at the lumbar intervertebral disc. She has nerve root signs at L4/5 with weak tibialis anterior affecting ankle dorsiflexion. Incidentally, the rash is the description of necrobiosis lipoidica diabeticorum, and not erythema nodosum or a vasculitis rash. Less than 50% of infective discitis patients have fever. Urgent MRI imaging is first choice here. CT guided biopsy can help to identify an organism if blood cultures remain negative, but only in 50% of cases. Staph. aureus and coagulase negative Staphylococci are the most common organisms. Tuberculosis should always be considered on the list of differential diagnoses in

You are called to see a 42 year old female who has become particularly confused. She was admitted three days prior following an accident on her bike and had sustained a cerebral contusion. This did not require any neurosurgical intervention. On examination, she was drowsy with a GCS of 13 and bilateral upgoing plantars but no focal neurology. Her pulse is 68 bpm with a blood pressure of 128/80 mmHg. Oxygen saturations are 99% on air.

Her blood results reveal the following:

| | |
|---|---|
| Sodium | 118 mmol/l (134-144) |
| Potassium | 3.8 mmol/l (3.5-5.5) |
| Urea | 4.5 mmol/l (3-8) |
| Creatinine | 80 micromol/l (50-100) |
| Glucose | 4.8 mmol/l (3.5-5.5) |

Which of the following would be the most appropriate initial treatment for this patient?

- ○ 100mg IV hydrocortisone stat
- ○ 150 mls of 3% hypertonic saline given over 20 mins
- ○ 1g phenytoin IV over 30 mins
- ○ 1l N saline over 4 hrs
- ○ Fluid restriction to 500 mls per day

| | | |
|---|---|---|
| ○ | Cranial diabetes insipidus | 15% |
| ○ | Hypoadrenalism | 0% |
| ○ | Fluid overload | 5% |
| ○ | Syndrome of inappropriate ADH (SIADH) ✔ Correct answer selected | 80% |
| ○ | Sick cell syndrome | 0% |

This patient has a deteriorating hyponatraemia with an inappropriately elevated urine osmolality and urine sodium excretion (should be less than 20 mmol/l). The most likely diagnosis is therefore SIADH. There is no evidence of hypoadrenalism. Diabetes insipidus would produce excessive fluid loss with hypernatraemia. Fluid overload is a potential diagnosis yet we are informed that the patient underwent fluid restriction.

116 mmol/l ✖ Incorrect answer 29%

selected

120 mmol/l ← Correct answer 66%

125 mmol/l 4%

130 mmol/l 0%

135 mmol/l 0%

A decision has been taken to treat this patient with hypertonic saline as she has acute symptomatic hyponatraemia which reflects underlying cerebral oedema. In this context, treatment with 150mls 3% hypertonic saline given over three hours can be lifesaving. The target sodium by which one should elevate the sodium is 5 mmol/l over the first hour. The increase in sodium should be then limited to 10mmol/l over the next 24hrs based on a clinical improvement.

A 62 year old woman with acute symptomatic hyponatraemia likely due to SIADH and associated with drowsiness is considered to be appropriate for immediate treatment with hypertonic saline. Her serum sodium is 115 mmol/l. What is the target sodium to which you would treat this patient over the next 1hr?

- 116 mmol/l
- 120 mmol/l
- 125 mmol/l
- 130 mmol/l
- 135 mmol/l

Diabetic Ketoacidosis ← 28%

Correct answer

Hyperosmolar Hyperglycaemic state ✖ Incorrect answer selected 49%

Type A lactic acidosis 2%

Type B lactic acidosis associated with metformin 20%

The most likely diagnosis is diabetic ketoacidosis (patient is acidotic) in a poorly controlled type 2 patient that may well have Latent Autoimmune Diabetes of Adulthood (LADA). Lactic acidosis with metformin is very rare and the patient's usually have severe renal impairment and would not be expected at this patient's level of dehydration. There is likely to be ketones present on POCT testing. This is not HHS as plasma osmolality is usually above 320 and glucose above 33 with a pH >7.3.

IV Dextrose 0%

IV Normal saline ✔ Correct 97%

answer selected

IV Pamidronate 2%

IV Prednisolone 0%

This patient has marked hypercalcaemia as reflected by the calcium above 3 mmol/l. The most appropriate initial management of this patient with dehydration and hypercalcaemia which is likely to be malignancy related is IV rehydration with normal saline. One would not contemplate IV bisphosphonate until rehydration is completed as this would compound the nephrotoxicity.

| | | |
|---|---|---|
| selected | ≤2.5 mmol/l ✔ Correct answer | 35% |
| | ≤3.5 mmol/l | 26% |

Autonomic counter-regulatory responses, including beta adrenergic stimulation and catecholamine secretion, commence at a threshold plasma glucose level ≤ 3.9 mmol/l in non-diabetic individuals and often occur at a lower level in patients with diabetes (especially well controlled diabetics) which means that adrenergic symptoms of hypoglycemia do not appear until the blood glucose drops to the lowered threshold that elicits the epinephrine response. This change in epinephrine response does not appear to be related to a structural abnormality of the adrenal medullae since diabetic patients with defective epinephrine response to hypoglycaemia have normal epinephrine responses to other stimuli such as exercise, standing or a meal. All defences against hypoglycemia—namely, the reduction of insulin and increments in glucagon and epinephrine—are impaired in type 1 diabetes, causing the clinical syndrome of defective glucose

An 18 year old student presents to A&E after just arriving from a beach holiday. She uses an insulin pump to manage her type 1 diabetes. She started feeling unwell whilst flying back home. She denies any fever or gastrointestinal symptoms. She has judiciously used the pump and only took it off whilst she went swimming. She has even changed the injection site and needle in flight as her blood glucose was 20mmol/L.

On admission to A&E her blood tests were as below:

Blood glucose: 36mmol/l (3.5-5.5)

Blood ketones: 5.4mmol (<1.5)

PH: 7.18

$HCO_3$: 8.1

What is the likely reason for developing DKA?

- ○ Blocked tubing due to air trapping in infusion set
- ○ Change in the size of Cannula should be done if persistent hyperglycaemia
- ○ Increase in the insulin dose was not done whilst in warm country
- ○ Insulin in the cartridge may have degraded due to high temperature and was ineffective
- ○ She may have been off her insulin pump for a longer period

Blocked tubing due to air trapping in infusion set 31%

Change in the size of Cannula should be done if persistent hyperglycaemia 1%

Increase in the insulin dose was not done whilst in warm country 3%

Insulin in the cartridge may have degraded due to high temperature and was ineffective ✔ Correct answer selected 52%

She may have been off her insulin pump for a longer period 12%

There are several reasons for worsening glycaemic control and recognition of the cause is vital to early intervention. High temperatures and exposure to light increase the degradation of insulin to transformation products (deaminated insulin, covalent dimers, and higher oligomers) and increase formation of fibrils, potentially causing a loss in biological potency.

Question ID #3537

A 31 year old woman who is 11 weeks pregnant presents with tachycardia, tremors and palpitations. She has strong family history of autoimmune thyroid disease and goitre. Her thyroid function test results are as shown below:

| | | |
|---|---|---|
| **Free $T_4$** | 32.8 pmol/L | (9-23) |
| **Free $T_3$** | 11.2 pmol/L | (3.5-6.5) |
| **TSH** | < 0.01 mU/L | (0.35-5.5) |

What is the best therapeutic option in her case?

- Carbimazole
- Lugols iodine
- Propanolol
- Propylthiouracil
- Radioiodine

| | |
|---|---|
| Lugols iodine | 1% |
| Propanolol | 9% |
| Propylthiouracil ✔ Correct answer selected | 76% |
| Radioiodine | 0% |

The patient is likely to have Graves` thyrotoxicosis as suggested by features of hyperthyroidism and associated strong family history of autoimmune thyroid disease. In view of her pregnant state, treatment with lowest dose of Propylthiouracil, which renders her euthyroid, should be initiated. The following are few of the salient points to be remembered as far as pregnancy and thyroid dysfunction is concerned:

- Thyroxine requirement increase in hypothyroid women during first trimester of pregnancy.
- TSH levels increase during $2^{nd}$ and $3^{rd}$ trimester of pregnancy.
- Hyperthyroidism in pregnancy is commonly due to Graves` disease (d/d hyperemesis gravidarum, H mole), so check TSH receptor antibodies (TRAb) in all such patients.
- Graves` disease can relapse during first trimester and post partum period (more likely to remit during $2^{nd}$ and $3^{rd}$ trimester)
- Check TRAb in third trimester, as it can be transmitted through placenta to baby, leading to neonatal hyperthyroidism
- Treat maternal hyperthyroidism with lowest possible dose of PTU (more protein bound, less transfer across placenta)

Ufone 10:06 AM 76%
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pain. She gives a history of approximately 5 kg weight loss over the past month to two months and also complains of persisting thirst and polyuria over the last 2 weeks. On examination her blood pressure is 105/65 mmHg, her pulse is 92 beats per minute and her and her body weight is 64.8 kg.

Investigations reveal:

| | Test Results | Normal Range Examples |
|---|---|---|
| **Plasma glucose** | 21.7 mmol/l | 3.5 - 5.5 |
| **pH** | 7.03 | 7.35 - 7.45 |
| **pCO2** | 2.9 Kpa | 4.6 - 6 |
| **pO2** | 15.6 Kpa | 11.1 - 14.4 |
| **Bicarbonate** | 4.6 mmol/l | 22 - 27 |
| **Haemoglobin** | 14.9 g/dl | 12 - 16 |
| **WCC** | 17.9 X $10^9$/L | 4 - 11 |

Which of the following is the most appropriate management of this patient?

- ○ Initiate fixed dose basal bolus SC insulin doses
- ○ Initiate IV fixed dose insulin regime (0.1 u/kg)
- ○ Initiate IV sliding scale insulin only
- ○ Initiate one stat dose of IV rapidly acting insulin (0.1 u/kg) followed by sliding scale insulin

A 26-year-old lady is reviewed in the clinic. She has a 10 year history of type 1 diabetes and admits to frequently missing insulin doses. Her current medication includes insulin glargine 42 units at night and Novorapid 12 units prior to each meal. On examination her BMI is 21 kg/m$^2$ her blood pressure is 105/65 mmHg.

Investigations reveal:

| | Test Results | Normal Range |
|---|---|---|
| **Hba1c** | 10.8% | <6 |
| **Total Cholesterol** | 4.1 mmol/l | <5 |
| **Plasma triglyceride** | 1.9 mmol/l | (0.9 - 2.2) |
| **TSH** | 0.65 mu/l | (0.32 - 5.5) |
| **Urine Ketones** | +++ | |
| **Urine Glucose** | +++ | |

Which of the following is a feature of urine ketone testing?

- ○ Heavy ketonuria implies the need for insulin initiation when identified in patients with type 2 diabetes
- ○ Ketonuria correlates closely with degree of acidosis in diabetic ketoacidois
- ○ Ketonuria resolves with correction of acidosis in diabetic ketoacidosis
- ○ Urine ketone sticks measure acetoacetate in the urine
- ○ Urine ketone sticks measure betahydroxybutyrate levels in the urine

Initiate IV fixed dose insulin regime (0.1 u/kg) ← Correct answer — 72%

Initiate IV sliding scale insulin only — 5%

Initiate one stat dose of IV rapidly acting insulin (0.1 u/kg) followed by sliding scale insulin ✖ Incorrect answer selected — 17%

Initiate sliding scale insulin with one dose of sc long acting insulin glargine (0.1 u/kg) — 4%

Fluid replacement is the cornerstone of therapy in the management of diabetic ketoacidosis (DKA). The total body deficit of fluid is around 5 - 8 litres and rehydration by reopening renal perfusion may on its own reduce blood glucose by up to 2%. Infusion of large quantities of hyptonic fluid may result in circulatory collapse and possible cerebral oedema. Consequently most authorities recommend initial hydration with 0.1554 mol /l saline, switching to hypotonic saline or dextrose if plasma sodium rises beyond 155 mmol/l. Current practice advocates fluid replacement at a rate of 2 litres over 4 hours, 2 litres over 8 hours and subsequently 1 litre every 8 hours. This rate of rehydration results in slower increases in sodium and chloride concentrations. Once the glucose has fallen to around 14 mmol/l, infusion of 10% glucose should be substituted for saline. This will allow continued infusion of insulin to correct metabolic acidosis and ketosis. Saline may be given simultaneously if the patient is still dehydrated. Administration of bicarbonate is not without risk: local irritation, hypokalaemia, rebound alkalosis and cerebral oedema are all potential consequences. Thus bicarbonate is generally only given in profound acidosis when the PH is < 6.9. Neutrophilia is a recognised acute response to ketoacidosis and antibiotics should only be administered if an infective aetiology or focus can be identified. As a result of both acidosis and insulin deficiency there is a total body potassium deficit of up to 1000 mmol, hence with rehydration, insulin replacement and correction of acidosis resulting in further potassium loss with restoration of urine flow, hypokalaemia is a major cause of death in ketoacidosis. The standard approach to insulin administration is using a fixed dose insulin regime rather than sliding scale insulin.

Joint British Society Guidelines

An 81 year old man is admitted acutely with a week history of feeling increasingly unwell and weak. He has a history of type 2 diabetes for which he takes metformin 1g bd and gliclazide 80mg bd. His last HbA1c was 10.1%. He also takes Ramipril and simvastatin.

On examination he appears dehydrated and unwell. His temperature is 37C , blood pressure 116/70 mmHg and a pulse of 102 bpm. Oxygen saturation is 98% on air and he has a respiratory rate of 22/min.

Blood results reveal:

| | |
|---|---|
| Sodium | 155 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 20.5 mmol/l (3-8) |
| Glucose | 37.2 mmol/l (3.5-5.5) |
| pH | 7.35 (7.35-7.45) |
| Bicarbonate | 18 mmol/l (22-28) |
| Ketones | 1.8 mmol/l (<1.5) |

Which of the following is the likely diagnosis?

- ○ Acute kidney injury associated with ACE inhibitor
- ○ Diabetic Ketoacidosis
- ○ Hyperosmolar Hyperglycaemic State
- ○ Severe dehydration with acute kidney injury
- ○ Type B lactic acidosis associated with metformin

An 18 year old woman was admitted to HDU for further management of diabetic ketoacidosis. She had 2 episodes of generalised tonic clonic seizures and became unresponsive after 3 hours of treatment as per a DKA pathway. On examination, she was slightly built, her pupils were equal and reactive to light. She had received 5mgs of diazepam and was post ictal. Her current blood glucose is 20mmol/L (initially 40mmol/L) and blood ketones are 3.2mmol (<1.5). Which of the following is the next step in management?

- ○ Give 150mls hypertonic saline over 10mins
- ○ IV Phenytoin and CT head
- ○ Reduce IV fluids infusion rate and arrange urgent CT head
- ○ Start IV cefotaxime and do Lumbar Puncture to rule out encephalitis
- ○ Stop IV fluids and give IV mannitol

Ufone 11:37 AM 60%
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- 100mg IV Hydrocortisone stat 3%
- 150mls of 3% hypertonic saline over 20 mins ✔ Correct answer selected 84%
- 1litre Normal saline infused over 4 hrs 7%
- Fluid restriction to 500mls per day 5%

This patient is likely to have hyponatraemic encephalopathy which is life threatening and has presented with a fit. Post-operative hyponatraemia is not uncommon and is likely to be due to a combination of SIADH which develops in the post-op period and the infusion of inappropriate IVIs. The European Endocrine Society Guidelines on severe hyponatraemic encephalopathy recommend a rapid correction of sodium by approximately 5 mmol/l. This can ameliorate the cerebral oedema that underlies this disorder. It is believed that with severe or moderately severe symptoms, the risk of brain oedema outweighs the risk of osmotic demyelination syndrome.

Ufone 11:55 AM 56%
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A 38 year old man with type 1 diabetes with CKD attends the clinic with an HbA1c of 88mmol/mol (<60). 2 months ago it was 54mmol/mol. Preparations for renal replacement therapy were initiated during his recent renal consultation. He was worried about long term haemodialysis. His current medications include insulin glargine 18 units at night, novorapid 8 units tds, alfa-calcidol, epoetin injections, aspirin and omeprazole. He continues to monitor his blood glucose and follows appropriate dietary management. Which of the following can explain his worsened HbA1c value?

- Alfacalcidol
- Erythropoeitin therapy
- Haemolysis due to uraemia
- Increased insulin requirements due to CKD
- Stress hyperglycaemia

- Alfacalcidol 2%
- Erythropoeitin therapy ← 50%

Correct answer

- Haemolysis due to uraemia 17%
- Increased insulin requirements due to CKD 9%
- Stress hyperglycaemia ✖ 22%

Incorrect answer selected

| | Increased HbA1c | Decreased HbA1c | Variable HbA1c |
|---|---|---|---|
| Red cell lifespan | Increased red cell survival: Previous splenectomy<br>Iron deficiency anaemia<br>Erythropoietin B12 treatment<br>Iron treatment<br>Erythropoiesis reduction | Red cell destruction: Splenomegaly<br>Rheumatoid arthritis<br>Haemolysis<br>Ribavirin or antiretrovirals | Haemoglobinopathies<br>Hb F<br>MetHb |
| Glycation | Alcoholism Chronic renal failure | Aspirin Vitamin C and E<br>Haemoglobinopathies | Genetic heterogeneity |
| Analytical interference | Hyperbilirubinaemia<br>High dose aspirin<br>Opiates<br>Carbamylated Hb | Hypertriglyceridaemia | Haemoglobinopathies |

A 28 year old female who is 30 weeks pregnant presents with profound tiredness and lethargy. She is noted to have a sodium of 130 mmol/l on routine testing and this sparks further investigation.

Her investigations reveal:

| | |
|---|---|
| **Cortisol post short synacthen test** | 252 nmol/l (>550) |
| **Free thyroxine** | 5.5 pmol/l (9-22) |
| **TSH** | 2.2 mu/l (0.5 - 5) |
| **Prolactin** | 3300 m/l (<450) |
| **estradiol** | 1300 pmol/l (130 - 800) |
| **LH** | 1.1 mu/l (2 - 10) |
| **FSH** | 1.0 mu/l (2 - 10) |

An MRI of the pituitary is performed which reveals enlargement of the pituitary bulging slightly beyond the sellar but with no obvious tumour.

Which of the following is the likely diagnosis?

- ○ Dysgerminoma
- ○ Lymphocytic hypophysitis
- ○ Non-functioning pituitary tumour
- ○ Prolactinoma
- ○ Silent pituitary infarction

Adrenal leukodystrophy 4%

Adrenal tuberculosis ✔ Correct 88%

answer selected

Histoplasmosis 2%

Metastatic disease 2%

Sarcoidosis 4%

Adrenal tuberculosis remains one of the commonest causes of adrenal insufficiency in the developing world with about 5% of the patients with disseminated tuberculosis (Miliary Koch's) developing significant adrenal insufficiency. A low threshold of suspicion to seek adrenal insufficiency is warranted in patients with tuberculosis as the symptoms and signs are non specific and at times are attributed to underlying condition (Tuberculosis). Adrenal tuberculosis is reversible with anti-tuberculosis medications if these are given at an early stage of the disease.

An Asian man is admitted with a history of weight loss, lethargy, nausea and vomiting. On examination he looks dehydrated and pigmented. His biochemical profile is as shown below:

| | | |
|---|---|---|
| **Sodium** | 124 mmol/L | (135-145) |
| **Potassium** | 5.6 mmol/L | (3.5-5.5) |
| **Urea** | 30 mmol/l | (7-20) |
| **Creatinine** | 104 µmol/L | (60-115) |
| **9 am cortisol** | 55 nmol/L | |
| **30 min cortisol** | 220 nmol/L | (Post ACTH injection) |

The CT image shows the presence of calcification within the adrenal gland. What is the likely aetiology of his adrenal insufficiency?

- ○ Adrenal leukodystrophy
- ○ Adrenal tuberculosis
- ○ Histoplasmosis
- ○ Metastatic disease
- ○ Sarcoidosis

Dysgerminoma 3%

Lymphocytic hypophysitis ← 16%

Correct answer

Non-functioning pituitary tumour 21%

✖ Incorrect answer selected

Prolactinoma 39%

Silent pituitary infarction 22%

This pregnant woman presents in the third trimester with a hyponatraemia, secondary hypothyroidism, an appropriate prolactin and oestradiol concentrations for this stage of pregnancy and an inadequate cortisol response to synacthen. This suggests partial hypopituitarism during the latter stages of pregnancy which is likely due to lymphocytic hypophysitis (LH). The exact cause of LH is unknown but is thought to be autoimmune-related. Some patients will recover either spontaneously or with a short course of steroids, others may have a more protracted course. The condition often presents in late pregnancy or the postpartum period. Even without the MRI, pituitary tumour is unlikely as the patient became pregnant - unlikely if there was pre-existent hypopituitarism associated with a pituitary tumour either functional or non-functional.

A 28 year old female who is 30 weeks pregnant presents with profound tiredness and lethargy. She is noted to have a sodium of 130 mmol/l on routine testing and this sparks further investigation.

Her investigations reveal:

| | |
|---|---|
| **Cortisol post short synacthen test** | 252 nmol/l (>550) |
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| **TSH** | 2.2 mu/l (0.5 - 5) |
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| **estradiol** | 1300 pmol/l (130 - 800) |
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| **FSH** | 1.0 mu/l (2 - 10) |

An MRI of the pituitary is performed which reveals enlargement of the pituitary bulging slightly beyond the sellar but with no obvious tumour.

Which of the following is the likely diagnosis?

- Dysgerminoma
- Lymphocytic hypophysitis
- Non-functioning pituitary tumour
- Prolactinoma
- Silent pituitary infarction

A 38 year old man with type 1 diabetes with CKD attends the clinic with an HbA1c of 88mmol/mol (<60). 2 months ago it was 54mmol/mol. Preparations for renal replacement therapy were initiated during his recent renal consultation. He was worried about long term haemodialysis. His current medications include insulin glargine 18 units at night, novorapid 8 units tds, alfa-calcidol, epoetin injections, aspirin and omeprazole. He continues to monitor his blood glucose and follows appropriate dietary management. Which of the following can explain his worsened HbA1c value?

- Alfacalcidol
- Erythropoeitin therapy
- Haemolysis due to uraemia
- Increased insulin requirements due to CKD
- Stress hyperglycaemia

Diabetic autonomic neuropathy 4%

Metformin 6%

Omeprazole ✔ Correct answer 25%

selected

Sitagliptin 7%

Vitamin D deficiency 58%

This patient has a hypocalcaemia associated with a severe hypomagnesaemia. This is likely due to the omeprazole, which results in increased GI magnesium losses. The hypomagnesaemia impairs the calcium sensing on the parathyroid cells; hence, this results in an induced hypoparathyroidism with hypocalcaemia. It is a good diagnosis to make but is often not appreciated.

This is not due to vitamin D deficiency as with osteomalacia the 25OHD would be lower, ALP raised and the patient would likely have a proximal

A 62 year old woman is referred to the medical intake with tingling and paraesthesia. The patient has been aware of deteriorating symptoms for one week. The GP asks whether this is a stroke. She has a background history of type 2 diabetes, hypertension and GORD for which she takes omeprazole, metformin, sitagliptin, simvastatin, Ramipril and amlodipine. On examination there is little of note.

Investigations reveal:

| | |
|---|---|
| Calcium | 2.06 mmol/l (2.2-2.6) |
| Magnesium | 0.3 mmol/l (0.7-1) |
| LFTs | Normal |

You see on the computer that a 25OHD level checked 1 month before by the GP reveals a level of 18 nmol/l (>50)

Which of the following is the likely cause of this patient's presentation?

- ○ Diabetic autonomic neuropathy
- ○ Metformin
- ○ Omeprazole
- ○ Sitagliptin
- ○ Vitamin D deficiency

Ufone 11:27 AM 61%
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You are called via the arrest bleep to a 43 year old woman who is on the surgical ward. She had a laparoscopic cholecystectomy performed two days ago and has since had nausea and vomiting and has been receiving IV dextrose. It transpires that she had a fit for which the nursing staff requested the arrest team. She is now drowsy. Her past medical history is unremarkable and U&E prior to surgery were reported to be within normal range.

On examination, she is drowsy with a GCS of 13. Her pulse is 88 bpm and blood pressure 132/88 mmHg with oxygen sats of 100% on air. There is no focal neurology and her plantar responses are equivocal.

Of note, her blood results reveal:

| | |
|---|---|
| Sodium | 118 mmol/l (135-144) |
| Potassium | 3.5 mmol/l (3.5-5) |
| Urea | 3.8 mmol/l (3-8) |
| Creatinine | 70 micromol/l (50-100) |
| Glucose | 4.1 mmol/l (3.5-6) |

Which of the following is the most appropriate initial treatment for this patient?

- ○ 15mg oral Tolvaptan
- ○ 100mg IV Hydrocortisone stat
- ○ 150mls of 3% hypertonic saline over 20 mins
- ○ 1litre Normal saline infused over 4 hrs
- ○ Fluid restriction to 500mls per day

Acute kidney injury associated with ACE inhibitor — 1%

Diabetic Ketoacidosis — 3%

Hyperosmolar Hyperglycaemic — 90%

State ✔ Correct answer selected

Severe dehydration with acute kidney injury — 3%

Type B lactic acidosis associated with metformin — 3%

The most likely diagnosis is HHS as plasma osmolality 376 mosmol/l with glucose above 33, bicarbonate above 15 and a pH >7.3. A trace of ketones may be noted (<3).

Reduce IV fluids infusion rate and arrange urgent CT head ✔ Correct answer selected — 59%

Start IV cefotaxime and do Lumbar Puncture to rule out encephalitis — 2%

Stop IV fluids and give IV mannitol — 20%

Cerebral oedema is a recognised complication in children, adolescents and adults with low body mass index. It can happen with large volume fluid resuscitation in DKA. Several mechanisms including vasogenic odema (damage to blood brain barrier), due to rapid changes in the osmolality with fluid therapy, and interventions like bicarbonate therapy, are thought to be the cause of cerebral oedema. In this scenario, one would initially reduce the rate of fluids and get a CT scan to confirm the diagnosis. This would take minutes and in the current litigious environoment, confirmation and exclusion of other diagnoses is important. Mannitol is also then a useful agent in this setting.

Ketonuria correlates closely with degree of acidosis in diabetic ketoacidois — 11%

Ketonuria resolves with correction of acidosis in diabetic ketoacidosis — 13%

Urine ketone sticks measure acetoacetate in the urine — 50% ✔ Correct answer selected

Urine ketone sticks measure betahydroxybutyrate levels in the urine — 18% ✖ Incorrect answer selected

Urine ketone testing measures acetoacetate in urine which is produced by metabolism of betahydroxybutyrate. Ketonuria persists despite correction of acidaemia in patients with ketoacidosis and does not correlate with the degree of acidosis. Ketonuria is not a marker of absolute insulin deficiency and may occur as a normal response to exercise or fasting.

QT shortening ✔ Correct answer selected — 72%

ST elevation — 0%

Tall tented T waves — 0%

Widened QRS complexes — 12%

The predominant abnormality here will relate to the markedly elevated calcium, not the mild hypokalaemia. The QT interval is typically shortened in hypercalcaemia. Other features in severe hypercalcaemia include J waves and bizarre QRS appearance.

A 62 year old woman is admitted to MAU through her GP as she has become increasingly unwell over the last few days. She is lethargic, has had occasional episodes of abdominal pain, and is clinically dehydrated. She has a recent history of metastatic breast cancer with bony involvement, for which she is receiving palliative treatment. Her results reveal:

| | |
|---|---|
| Sodium | 144 mmol/l (134-144) |
| Potassium | 3.1 mmol/l (3.5-5.5) |
| Calcium | 4.1 mmol/l (2.2-2.6) |

Which of the following would you expect to find on the ECG?

- ○ Prolonged PR Interval
- ○ QT shortening
- ○ ST elevation
- ○ Tall tented T waves
- ○ Widened QRS complexes

An 18-year-old young lady is admitted to the acute medical unit with nausea, vomiting and abdominal pain. She gives a history of approximately 5 kg weight loss over the past month to two months and also complains of persisting thirst and polyuria over the last 2 weeks. On examination her blood pressure is 105/65 mmHg, her pulse is 92 beats per minute and her and her body weight is 64.8 kg.

Investigations reveal:

| | Test Results | Normal Range Examples |
|---|---|---|
| **Plasma glucose** | 21.7 mmol/l | 3.5 - 5.5 |
| **pH** | 7.03 | 7.35 - 7.45 |
| **pCO2** | 2.9 Kpa | 4.6 - 6 |
| **pO2** | 15.6 Kpa | 11.1 - 14.4 |
| **Bicarbonate** | 4.6 mmol/l | 22 - 27 |
| **Haemoglobin** | 14.9 g/dl | 12 - 16 |
| **WCC** | 17.9 X $10^9$/L | 4 - 11 |

Which of the following is the most appropriate management of this patient?

- ○ Initiate fixed dose basal bolus SC insulin doses
- ○ Initiate IV fixed dose insulin regime (0.1 u/kg)
- ○ Initiate IV sliding scale insulin only
- ○ Initiate one stat dose of IV rapidly acting insulin (0.1 u/kg) followed by sliding scale insulin

A 46 year old man presents to the MAU jaundiced. He has known chronic liver disease and continues to drink to excess. He is jaundiced and unwell. On examination, he has no evidence of ascites but does have some tenderness in the right upper quadrant. You clinically suspect he has alcoholic hepatitis.

His blood results show:

| | | |
|---|---|---|
| Haemoglobin | 13.1 | Normal range (130-180 g/l) |
| White cell count | 12.9 | Normal range (4.0-11.0 x$10^9$/L) |
| Mean Cell Volume | 108 | Normal range (80-100 fL) |
| Platelets | 78 | Normal range (150-400 x$10^9$/L) |
| Bilirubin | 189 | Normal range (<21 umol/L) |
| Alkaline phosphatase | 180 | Normal range (30-150 U/L) |
| Alanine transferase | 360 | Normal range (<59 U/L) |
| Prothrombin time | 28.2 | Normal range (9.0-13.0 SEC) |

Which of the following scoring systems best determines the longer-term prognosis of his underlying chronic liver disease?

- ○ Child-Pugh score
- ○ Glasgow alcoholic hepatitis score
- ○ Glasgow Blatchford score
- ○ Hepatitis Discriminant function
- ○ Rockall score

| | | |
|---|---|---|
| Child-Pugh score answer selected | ✔ Correct | 53% |
| Glasgow alcoholic hepatitis score | | 22% |
| Glasgow Blatchford score | | 0% |
| Hepatitis Discriminant function | | 23% |
| Rockall score | | 1% |

This Is the only score system in the list used for assessing chronic liver disease. The Glasgow alcoholic hepatitis score and discriminant function can both be used to assess prognosis and guide treatment of acute alcoholic hepatitis, but have not been validated for chronic liver disease alone. The Blatchford score and Rockall score are used in gastrointestinal bleeding. Maddrey's Alcohol Discriminant Score provides a better approximate of the shorter term prognosis.

A 36 year old woman starts a new medication prescribed by her GP. Four weeks later she presents to A and E with severe abdominal pain and is diagnosed with acute pancreatitis.

The pancreatitis is thought to be secondary to the new medication; it is duly discontinued, and the pancreatitis resolves.

Six months later, the same medication is reinitiated and pancreatitis develops within 8 hours.

What is the mechanism causing this drug-induced pancreatitis?

- ○ Accumulation of toxic metabolite
- ○ Drug interaction
- ○ Hypersensitivity reaction
- ○ Immunomodulatory up-regulation
- ○ Intrinsic toxicity

Question ID #3948

Which of the following patients has the most valid indication for urgent assessment for potential liver transplantation?

- A 27 year old man with Wilson's disease and evidence of encephalopathy
- A 59 year old man with hepatocellular carcinoma with evidence of local extrahepatic spread
- A 38 year old woman with paracetamol overdose with an ALT of 3500 IU
- A 56 year old woman with cholangiocarcinoma
- An 82 year old woman with Worsening primary biliary cirrhosis and bilirubin over 100 IU

A 20-year-old otherwise healthy student presents with three months of abdominal pain, diarrhea, a 4kg weight loss, and diffuse arthropathy but no fevers. He has no travel history, takes no regular medication, is a nonsmoker, and his family history is significant only for an uncle who had "some bowel removed." His examination is remarkable for normal vital signs and right lower quadrant tenderness with no masses or organomegaly palpable.

What is the single next best test to confirm his diagnosis?

- Barium enema
- Capsule enteroscopy
- Colonoscopy with ileal intubation
- P-ANCA
- Stool studies

| | | |
|---|---|---|
| | Capsule enteroscopy | 12% |
| | Colonoscopy with ileal intubation ✔ Correct answer selected | 66% |
| ○ | P-ANCA | 0% |
| | Stool studies | 17% |

This patient has signs and symptoms consistent with ileal and right-sided colonic Crohn's disease. Although stool studies should be done as part of his evaluation, given the duration of symptoms, he is unlikely to have an infection. His significant weight loss is an indicator that more invasive testing is required. In patients with Crohn's disease, P-ANCA is associated with a UC-like phenotype, but this is not a diagnostic test. A barium enema may show inflammatory changes of the colon suggestive of Crohn's disease, but will not necessarily evaluate the terminal ileum, and biopsy specimens cannot be taken; barium enemas have been largely superseded by other imaging modalities in the UK. Capsule enteroscopy is highly sensitive in identifying the lesions of Crohn's disease, but is not specific and therefore should not generally be used as a first-line diagnostic study. Further, biopsy specimens cannot be taken, and the risk of capsule retention in the setting of a stricture can be as high as 25%. Colonoscopy with ileal intubation will not only allow macroscopic visualization of inflammatory changes in the colon and terminal ileum, but biopsies performed in both inflamed and noninflamed tissue will permit histologic mapping

Refer for psychiatric assessment 1%

Refer to liver centre for consideration of liver transplant ✔ Correct answer selected 92%

The King's College guidelines are the most widely used has published guidelines on when to refer for liver transplantation in paracetamol overdose and acute liver failure.

King's College Hospital criteria for transplantation in acute liver failure:

**Paracetamol**

+ pH <7.30 (irrespective of grade of encephalopathy)

+ Prothrombin time >100 seconds and serum creatinine >300 µmol/l if in grade III or IV coma

**Non-paracetamol**

+ Prothrombin time >100 seconds (irrespective of grade of encephalopathy) or

+ Any three of the following (irrespective of grade of encephalopathy):

- aetiology: non-A, non-B (indeterminate) hepatitis, halothane hepatitis, idiosyncratic drug reactions
- age <10 or >40 years
- jaundice to encephalopathy interval >7 days
- prothrombin time >50 seconds
- serum bilirubin >300 µmol/l

**Further Reading**

Grade 0 0%

Grade 1 8%

Grade 2 ← Correct answer 59%

Grade 3 32%

Grade 4 ✖ Incorrect answer 0%

selected

This correlates as moderate encephalopathy. It is important to recognize encephalopathy and its severity as it is largely a clinical diagnosis, and prompt treatment is appropriate. The West Haven Encephalopathy grading system is the most common tool used to grade the severity of encephalopathy and it is summarized in the list below;

- Grade 0 - minimal HE – difficult to diagnose clinically
- Grade 1 -Mild HE - Trivial lack of awareness; euphoria or anxiety; shortened attention span; impaired performance of addition or subtraction
- Grade 2 - Moderate HE - Lethargy or apathy; minimal disorientation for time or place; subtle personality change; inappropriate behavior
- Grade 3 - Severe HE- Somnolence to semi stupor, but responsive to verbal stimuli; confusion; gross disorientation
- Grade 4 - Coma

HCV related cryoglobulinemia 25%

HCV related membranoproliferative glomerulonephritis 43%

Interferon induced focal segmental glomerulosclerosis 26% ✔ Correct answer selected

The main causes of nephrotic range proteinuria include diabetic nephropathy, minimal change disease, focal segmental glomerulosclerosis, membranous nephropathy and amyloidosis. Hepatitis C related renal disease manifests as either membranoproliferative glomerulonephritis, membranous nephropathy or cryoglobulinemia. The mainstay treatment in all 3 cases remains treatment of hepatitis C itself with a target of achieving seroconversion. Considering seroconversion is achieved in this case the diagnosis is unlikely to be one of these 3 options. Interferon therapy is known to cause focal segmental glomerulosclerosis with mainstay treatment being removal of offending agent.

Ufone 7:15 PM 100%
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Question ID #3759

A 24 year old woman is admitted with an 8 hour history of abdominal pain. The pain began at approximately 1am as an epigastrium pain, which was relatively constant, though it had some colicky features to it in that it grew in intensity on occasions and then subsided a little. She felt nauseous with the pain but had not vomited. After enduring the pain for a few hours she went to hospital.

In her past history, she was diagnosed with Crohn's disease and had been on infliximab for the last 5 years. She had been in remission since then. Other than infliximab she took the combined oral contraceptive.

She had opened her bowels normally the morning beforehand, was unaware of any diarrhoea or blood in her motion. She denied eating anything that upset her stomach, or so she thought. She is currently having a withdrawal menstrual bleed having regularly taking the OCP.

On examination, she was tearful, had a pulse of 82 bpm, a blood pressure of 122/80 mmHg and a temperature of 37.7C. Examination of the abdomen revealed some tenderness in the epigastrium with more tenderness and guarding in the right iliac fossa. No abnormality was noted on PR examination.

Investigations reveal:

epigastrium with more tenderness and guarding in the right iliac fossa. No abnormality was noted on PR examination.

Investigations reveal:

| | |
|---|---|
| Haemoglobin | 13.3 g/dl (12-16) |
| White count | 9.4 $x10^6$/l (3-10) |
| Platelets | 154 $x10^6$/l (140-400) |
| U+Es | Normal |
| CRP | 5mg/l (<5) |

Which of the following is the most appropriate investigation for this patient?

- ○ Beta-HCG estimation
- ○ CMV PCR on serum
- ○ Colonoscopy with biopsy
- ○ Sigmoidoscopy
- ○ Ultrasound abdomen and pelvis

nothing on the clinical portal about this.

On examination, she is comfortable but appears pale. Her BMI is 32.2 kg/m2. Her pulse is 70 bpm irregular and blood pressure is 110/70 mmHg. There is nothing to find on examination other than she having a below knee amputation and PR examination is normal.

Other than the above all other results are normal including U+Es and LFTs. Ferritin was 10 microg/l (30-100) and INR was 2.5. Chest x-ray is normal.

Which of the following is the most appropriate management strategy for this patient?

- ○ Give IV iron and arrange outpatient upper and lower GI studies
- ○ Increase dose of iron, stop warfarin and discharge with OPD upper and lower GI studies
- ○ Transfuse, continue warfarin and arrange OPD upper and lower GI studies
- ○ Transfuse, stop her warfarin and arrange inpatient upper and lower GI studies
- ○ Transfuse, stop her warfarin and arrange outpatient endoscopy

Give IV iron and arrange outpatient upper and lower GI studies 18%

Increase dose of iron, stop warfarin and discharge with OPD upper and lower GI studies ✖ Incorrect answer selected 5%

Transfuse, continue warfarin and arrange OPD upper and lower GI studies ← Correct answer 34%

Transfuse, stop her warfarin and arrange inpatient upper and lower GI studies 40%

Transfuse, stop her warfarin and arrange outpatient endoscopy 3%

This lady has an iron deficiency anaemia which appears to be long standing as she is haemodynamically stable and has no overt source of bleeding. The likely source is therefore diverticular disease or malignancy, which seems less likely in view of the normal weight and lack of GI symptoms. The issue is further complicated by the fact that she needs to be anticoagulated which is required lifelong due to the embolism and previous DVT. Therefore, on balance warfarin should continue, the patient should be transfused for symptomatic improvement and the dose of iron can be increased. The patient can then be discharged with assessment of Hb to ensure stability and GI studies organised as an outpatient – CT colonogram initially and endoscopy.

A 47-year-old woman presents to the emergency department with several hours' history of nausea and severe pain in the abdomen. She describes her pain as unrelenting mid-epigastric pain radiating to her back.

On examination, the patient is in the fetal position and reluctant to move. She is tachycardic and has a low-grade fever. Orthostatic hypotension is noted. Laboratory study results are remarkable except for an amylase level of 1100 iu/l (<100)

Which of the following tests is most appropriate for assessing the severity of her illness?

- ○ Abdominal radiograph (kidneys, ureter, bladder [KUB])
- ○ Abdominal ultrasonography (US)
- ○ Computed tomography (CT)
- ○ Endoscopic retrograde cholangiopancreatography (ERCP)
- ○ Magnetic resonance imaging (MRI)

Peer responses

| | |
|---|---|
| No treatment currently required. Await cultures | 26% |
| Oral co-trimoxazole | 1% |
| Oral immodium | 0% |
| Oral metronidazole ✔ Correct answer selected | 62% |
| Oral vancomycin | 11% |

This patient is symptomatic with profuse watery diarrhoea, likely from the history to be due to C. Difficile infection. The patient should be treated with oral metronidazole as 1 st line therapy. In more severe cases complicated by systemic illness, oral vancomycin can be used. It is important to remember that supportive care should always be given, including attention to hydration, electrolytes and nutrition. Antiperistaltic agents should be avoided in acute infection due to risk of toxic megacolon. Metronidazole (or vancomycin, if appropriate) can be commenced if patient has diarrhoea AND one of the following: Positive C. difficile toxin test OR Results of C. difficile toxin test pending AND clinical suspicion of C.diff. That means treatment can be commenced if there is strong clinical suspicion while stool results are awaited.

An abdominal radiograph was read as normal.

A CT of the abdomen and pelvis with contrast revealed significant inflammatory changes within the mesenteric fat surrounding the cecum and thickening of the wall of the cecum.

What is the most likely diagnosis?

- Appendicitis
- Colonic perforation
- Gastroenteritis
- Mesenteric adenitis
- Postpolypectomy electrocoagulation syndrome

Faecal calprotectin ✔ Correct 67%

answer selected

Faecal MC&S 2%

Flexible sigmoidoscopy 7%

Serum elastase 8%

The raised platelet count should raise suspicions of ongoing inflammation. A calprotectin level is a good marker for inflammation in the gastrointestinal tract, and a negative result in the presence of symptoms effectively excludes inflammatory bowel disease, thus avoiding the need for an invasive test in a young patient. This patient does not have signs of acute severe inflammatory bowel disease and therefore doesn't need immediate colonoscopy, although she is likely to require it in the future. 3 negative stool tests is quite convincing for a lack of infection in the stool, and elastase should be measured in the stool, not the serum, for suspected pancreatic insufficiency.

A 50 year old man presents with acute onset ascites. He is known to have Hepatitis C and cirrhosis but is normally well controlled on Spironolactone 50 mg OD, Lactulose 15ml BD and Mirtazapine 15mg OD.

On examination he has mild to moderate ascites.

His blood results show:

| | |
|---|---|
| Sodium | 129 mmol/l (134-144) |
| Potassium | 5.1 mmol/l (3.5-5) |
| Urea | 5.8 mmol/l (3-8) |
| Creatinine | 119 micromol /l (50-110) |

What is the most likely cause of his deranged renal function?

- ○ Acute interstitial nephritis
- ○ Acute tubular necrosis
- ○ Hepatorenal syndrome
- ○ Nephrotic syndrome
- ○ Renal papillary necrosis

An 18 year old girl presents to the MAU with her mother. They are quite upset. She has been experiencing diarrhea for the last 5 months, and they are frustrated with lack of action from the GP and have self presented. She has been diagnosed as having Irritable bowel syndrome by her GP, who has sent off 3 different stool samples, all of which are negative. She has not lost weight, and has no other gastrointestinal symptoms.

Investigations reveal:

| | | |
|---|---|---|
| Haemoglobin | 13.1 | Normal range (130-180 g/l) |
| White cell count | 6.0 | Normal range (4.0-11.0 x$10^9$/L) |
| Mean cell volume | 82 | Normal range (80-100 fL) |
| Platelets | 512 | Normal range (150-400 x$10^9$/L) |
| Bilirubin | 45 | Normal range (<21 umol/L) |
| Alkaline phosphatase | 130 | Normal range (30-150 U/L) |
| Alanine transferase | 31 | Normal range (<59 U/L) |
| CRP | 11 | Normal range (<5) |

Which of the following is the most appropriate investigation for this patient?

- Colonoscopy
- Faecal calprotectin
- Faecal MC&S
- Flexible sigmoidoscopy
- Serum elastase

Appendicitis 5%

Colonic perforation ✖ Incorrect 36%

answer selected

Gastroenteritis 1%

Mesenteric adenitis 16%

Postpolypectomy electrocoagulation syndrome 42%

Postpolypectomy electrocoagulation syndrome ← Correct answer

Postpolypectomy electrocoagulation syndrome, also known as postpolypectomy syndrome, transmural burn syndrome, or microperforation, is a rare but important complication of polypectomy, and is a potential reason for patients to re-present to hospital following a colonoscopy. Patients with postpolypectomy electrocoagulation syndrome typically present within 12 hours following a colonoscopy with fever, tachycardia, and generalized abdominal pain. However, the onset of symptoms may be delayed by up to 5–7 days after the procedure. They are generally managed conservatively with intravenous fluids, pain control, and gradual advancement of diet as tolerated, with or without antibiotics against Gram-negative and anaerobic pathogens.

A 74-year-old man with past medical history of coronary artery disease and hypertension presented to emergency care with complaints of fever and abdominal pain 5 hours after a colonoscopic snare polypectomy of a caecal tubulovillous polyp.

He initially tolerated the procedure well, but he noted development of an intermittent, diffuse cramping abdominal pain after returning home, which was relieved by passing flatus. A few hours later, he developed a 9/10 right lower quadrant abdominal pain aggravated by coughing and movement without significant relieving factors. He denies nausea, vomiting, or change in bowel habits.

On examination, the patient had a temperature of 38.1°C but his other observations were normal. On abdominal examination, the patient had normal bowel sounds with diffuse tenderness, most prominent in the right lower quadrant. There was no guarding or rigidity.

Laboratory tests revealed:

| | | |
|---|---|---|
| Haemoglobin | 13.1 | Normal range (130-180 g/l) |
| White cell count | 19.0 | Normal range (4.0-11.0 $x10^9$/L) |
| Mean Cell Volume | 98 | Normal range (80-100 fL) |
| Platelets | 414 | Normal range (150-400 $x10^9$/L) |
| Prothrombin time | 11.2 | Normal range (9.0-13.0 SEC) |
| Lactate | 1.9 | Normal range: 0.5–2.2 mmol/L) |

An abdominal radiograph was read as normal

Question ID #3584

You are called to see an 82 year old man on the ward who has developed offensive, watery diarrhoea. The man was admitted with chest infection and treated appropriately and, whilst awaiting home assessment and institution of a package of care, has developed diarrhoea associated with some abdominal pain.

He seems comfortable, his temperature is 37.3C, pulse 88 bpm and blood pressure 128/80 mmHg. He has some abdominal tenderness and some increased bowel sounds. His abdominal X-ray is normal and his blood results are normal with a CRP of 12 mg/dl (<5). faecal specimens have been sent and the patient is isolated.

Which of the following is the most appropriate approach to treating this patient?

- No treatment currently required. Await cultures
- Oral co-trimoxazole
- Oral immodium
- Oral metronidazole
- Oral vancomycin

Abdominal radiograph (kidneys, ureter, bladder [KUB]) 2%

Abdominal ultrasonography (US) 9%

Computed tomography (CT) ✔ 81%

Correct answer selected

Endoscopic retrograde cholangiopancreatography (ERCP) 2%

Magnetic resonance imaging (MRI) 6%

CT is the modality of choice to assess the severity of acute pancreatitis and the presence of associated complications. More specifically, CT with dynamic intravenous contrast injection can determine the presence and extent of pancreatic necrosis, which remains the primary determinant of length of hospitalization and mortality. Although a KUB can rule out other etiologies for abdominal pain, it does not directly image the pancreas. Imaging by transabdominal US is severely limited by poor transmission of ultrasound waves through bowel gas that normally surrounds the pancreas. MRI is not superior to CT for imaging in acute pancreatitis and is both less available and more expensive. ERCP is contraindicated in acute pancreatitis unless there is evidence of concurrent cholangitis.

Urine Analysis

| | | |
|---|---|---|
| Blood | Nil | |
| Protein | ++++ | (24 hours quantification: 6.7g) |
| Glucose | + | |
| Microscopy | Few hyaline casts | |

What is the most likely diagnosis?

- ○ Amyloidosis
- ○ Diabetic nephropathy
- ○ HCV related cryoglobulinemia
- ○ HCV related membranoproliferative glomerulonephritis
- ○ Interferon induced focal segmental glomerulosclerosis

A 72 year old woman is admitted by her GP with a history of fatigue and weakness which had deteriorated over the last month. The GP had checked her bloods and discovered a haemoglobin of 6.7 g/dl (12-16) with an MCV of 59 fl. She had a past history of type 2 diabetes for which she takes metformin 500 mg bd and her most recent HbA1c checked 2 weeks ago was 68 mmol/mol (<48). She also has a history of previous DVT and atrial fibrillation with arterial embolism for which she had required a left below knee amputation. Consequently she remains on lifelong warfarin. She takes bisoprolol 2.5 mg/d, ramipril 2.5 mg daily, omeprazole 40mg daily, ferrous fumarate 210mg bd and simvastatin 40mg daily.

She describes feeling weak and lethargic over the last month, which has culminated in her seeing her GP. She denies any abdominal pains and has been unaware of any melaena or PR blood loss. She denies any weight loss. There was some story about iron deficiency a year or so ago for which she had been prescribed iron tablets. There was nothing on the clinical portal about this.

On examination, she is comfortable but appears pale. Her BMI is 32.2 kg/m2. Her pulse is 70 bpm irregular and blood pressure is 110/70 mmHg. There is nothing to find on examination other than she having a below knee amputation and PR examination is normal.

Which of the following is the most appropriate investigation for this patient?

Peer responses

| | |
|---|---|
| Beta-HCG estimation | 39% |
| CMV PCR on serum | 4% |
| Colonoscopy with biopsy | 3% |
| Sigmoidoscopy | 0% |
| Ultrasound abdomen and pelvis ✔ Correct answer selected | 54% |

This young woman with a history of Crohn's disease that has been well controlled and in remission, presents with a short history of abdominal pain that began in the abdomen and shifted to become more apparent in the right iliac fossa. This together with the low grade fever, low CRP and WCC suggests a diagnosis of appendicitis. CT or USS can assist in the diagnosis and may reveal appendicular inflammation with fluid. Generally in the UK USS would be the initial investigation then CT or MRI. The differential would include ectopic pregnancy but in this case the history is more in keeping with appendicitis, the patient is taking the oral contraceptive and is having a withdrawal bleed.

A 40 year old Asian gentleman has been referred from the liver clinic where he is being treated for hepatitis C with pegylated interferon and ribavirin for the last 12 weeks. Over the last 3 weeks the patient has noted swelling of his ankles and feet along with shortness of breath on exertion. There is no history of a decrease in urine output, although he has noted frothing of urine.

On examination, he has a blood pressure of 130/80 mmHg, a pulse rate of 100/minute and a temperature of 38C. He has significant pedal edema. On chest examination, he has dull percussion note at both bases with decreased breath sounds and decreased vocal fremitus. On abdominal examination, there is no visceromegaly but shifting dullness is present.

Laboratory investigations reveal:

| | | |
|---|---|---|
| Hb | 11.6 g/dl | 13-18 g/dl |
| WBC | 9 x $10^9$/l | 4-11 x $10^9$/l |
| Platelets | 455 x $10^9$/l | 150-300 x $10^9$/l |
| PT | 12 seconds | 12-14 seconds |
| APTT | 34 seconds | 30-46 seconds |
| Urea | 23 mmol/l | 2.5-6.7 mmol/l |
| Serum creatinine | 488 mmol/l | 88-120 mmol/l |
| Bilirubin | 3 umol/l | 2-17 umol/l |
| ALT | 35 iu/l | 5-40 iu/l |
| Serum albumin | 22 g/l | 34-48 g/l |
| C3, C4 | Within limits | |
| Anti HCV | Positive | |
| HCV PCR RNA | Not detected | |
| HBsAg | Negative | |

A 62-year-old man with alcoholic liver disease presents acutely unwell to the A&E. He is jaundiced and is behaving strangely. He keeps forgetting who you are as you take the history from him, and his speech is slurred. He has had chronic liver disease secondary to alcohol for many years according to his notes, and his medications are thiamine 50mg daily plus lactulose 10ml twice daily.

On examination, he is icteric and tremulous plus has evidence of asterixis. His abdomen is soft and non-tender, with no shifting dullness.

According to the West Haven Encephalopathy scale, what grade of encephalopathy does this patient have?

- Grade 0
- Grade 1
- Grade 2
- Grade 3
- Grade 4

A 38-year-old woman presents acutely to the MAU. A friend found her unconscious at home this morning. She was found with an empty bottle of paracetamol and 2 bottles of vodka. She was started on N acetyl cysteine in A&E and has been transferred through to you for medical assessment and management.

Her bloods show;

| | | |
|---|---|---|
| Haemoglobin | 12.1 | Normal range (130-180 g/l) |
| White cell count | 11.8 | Normal range (4.0-11.0 x$10^9$/L) |
| Mean Cell Volume | 96 | Normal range (80-100 fL) |
| Platelets | 300 | Normal range (150-400 x$10^9$/L) |
| Bilirubin | 215 | Normal range (<21 umol/L) |
| Alkaline phosphatase | 180 | Normal range (30-150 U/L) |
| Alanine transferase | 2690 | Normal range (<59 U/L) |
| Prothrombin time | 58.2 | Normal range (9.0-13.0 SEC) |

Arterial blood gas on air

pH 7.21 (7.34-7.44)

pO2 14.1kPa (11-13)

pCO2 3.9 kPa (3.4-4.4)

What is the most appropriate management at this point?

- ○ Add lactulose
- ○ Add Pabrinex
- ○ Add vitamin K
- ○ Refer for psychiatric assessment
- ○ Refer to liver centre for consideration of liver transplant

A 39-year-old man is noted to have jaundice two days after uncomplicated appendicectomy. The surgery and postoperative course were uneventful, without documented episodes of hemodynamic instability, and his surgical incision has no signs of infection.

He is found to have an elevated indirect bilirubin level with a serum ALT level 1.5 times the upper limit of normal. The result of a full blood count is normal.

Which of the following is the most likely diagnosis?

- ○ Anaesthetic agent–induced hepatotoxicity
- ○ Analgesic agent–induced hepatotoxicity
- ○ Haemolytic anemia?
- ○ Ischaemic hepatitis?
- ○ Postoperative cholestasis

Diabetic autonomic neuropathy 4%

Metformin 6%

Omeprazole ✔ Correct answer 25%

selected

Sitagliptin 7%

Vitamin D deficiency 58%

This patient has a hypocalcaemia associated with a severe hypomagnesaemia. This is likely due to the omeprazole, which results in increased GI magnesium losses. The hypomagnesaemia impairs the calcium sensing on the parathyroid cells; hence, this results in an induced hypoparathyroidism with hypocalcaemia. It is a good diagnosis to make but is often not appreciated.

This is not due to vitamin D deficiency as with osteomalacia the 25OHD would be lower, ALP raised and the patient would likely have a proximal myopathy.

A 42 year old lady with alcoholic liver disease and cirrhosis presents with acutely decompensated liver disease and ascites.

Her blood results are as follows:

| | |
|---|---|
| Haemoglobin | 116 g/l (12-16) |
| WCC | 12 (3-10) |
| Platelets | 110 (140-400) |
| Prothrombin time | 19s (11-14) |
| Sodium | 130 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5) |
| Urea | 8 mmol/l (3-8) |
| Creatinine | 130 micromol/l (50-100) |
| Alkaline phosphatase | 450 iu/l (50-100) |
| AST | 90 iu/l (0-50) |
| Bilirubin | 100 micromol/l (0-20) |
| Albumin | 25 g/l (35-45) |

She undergoes an ultrasound scan of the liver and is found to have a thrombus causing hepatic venous obstruction. She is started on diuretic therapy and her ascites responds well. Given her coagulopathy, what is the correct management of her thrombus?

- ○ Aspirin
- ○ Conservative management without anticoagulation
- ○ Intravenous heparin
- ○ Subcutaneous LMWH
- ○ Warfarin with a target INR of 2.5

Aspirin 4%

Conservative management without anticoagulation 10%

Intravenous heparin 24%

Subcutaneous LMWH ✖ 51%

Incorrect answer selected

Warfarin with a target INR of 2.5 11%

← Correct answer

Although it may seem counterintuitive, the first line treatment should be anticoagulation, although this can be problematic in patients with liver disease. An alternative can be a TIPs procedure. The safest anticoagulant to use long term is Warfarin as it can be reversed easily.

| | | |
|---|---|---|
| Bilirubin | 90 | Normal range (<21 umol/L |
| Alkaline phosphatase | 880 | Normal range (30-150 U/L) |
| Alanine transferase | 450 | Normal range (<59 U/L) |
| Prothombin time | 20.2 | Normal range (9.0-13.0 SEC) |

An ultrasound of the abdomen shows a bright liver

What should be the next stage in her management?

- Measure paracetamol levels
- Reassure and liaise with obstetrics regarding continuing with planned pregnancy
- Start N acetyl cysteine
- Start ursodeoxycholic acid
- Urgent gastroenterology/hepatology review and liaise with obstetric team for early delivery of baby

Ufone 9:24 AM 62%
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A 54-year-old man presents with haematemesis. He has a history of diabetes mellitus, hypertension and two months ago was diagnosed with acute coronary syndrome. He smokes twenty cigarettes a day up until his admission with ACS but has since stopped.

He undergoes endoscopy which confirmed the presence of a small duodenal ulcer. He was taking aspirin and clopidogrel which were stopped and intravenous omeprazole commenced. On day 4 he was doing well. He had had no further haematemesis. He had a pulse of 68 bpm regular and a blood pressure of 136/80 mmHg. He was started on oral omeprazole. When should the anti-platelet therapy be restarted?

- Day 5
- Day 30
- Day 90
- Day 180
- Do not re-start antiplatelet agents

A 36 year old engineer with Ulcerative colitis presents with rectal bleeding. He is opening his bowels twice a day but not at night, passing blood and mucous. He is also complaining of generalized abdominal pain. His only other medical history is of eczema. This is his first flare of colitis since his initial presentation 3 years ago. His usual medications are Mesalazine 2.4g daily and Diprobase cream.

On examination his abdomen is soft but minimally tender. His blood tests are normal other than a CRP of 44 mg/dl (normal range <5).

His chest and abdominal films are normal, with no evidence of perforation or toxic dilatation.

What is the most appropriate management for this patient?

- Double mesalazine dose to 4.8g
- Reassure and advise to continue mesalazine at current dose
- Start Azathioprine at 50mg daily, then titrate up to target weight based dose after 2 weeks
- Start Intravenous Hydrocortisone
- Start Prednisolone 30mg daily

Peer responses

| | |
|---|---|
| Amoxicillin and Clarithromycin | 4% |
| Co-Trimoxazole | 19% |
| Doxycycline | 0% |
| Rifampicin, Isoniazid, Ethambutol and Pyrazinamide ✔ answer selected | 70% Correct |
| Tazocin | 6% |

This gentleman has miliary TB. Anti-TNF agents can cause relapses of previously dormant or unknown TB, and these often present as miliary TB due to the immunosuppressive effects of infliximab. All patients should be screened for TB vaccination prior to treatment, but sometimes this is missed, especially in emergencies. a such the correct treatment here is for TB.

Abdominal CT 15%

Abdominal x ray ✔ Correct answer selected 65%

Faecal Calprotectin 1%

Stool microscopy culture and sensitivity 3%

Urgent Flexible sigmoidoscopy 17%

This gentleman has fulminant/severe ulcerative colitis. The major concern is toxic dilatation of the colon, which can be quickly assessed with an abdominal x ray. These patients may well need an abdominal CT too, but an X ray is the most urgent first line test. Stool microscopy culture and sensitivity should be sent but results will take some time. An urgent flexible sigmoidoscopy is unlikely to change the management during the initial assessment phase as the patient is known to have ulcerative colitis, and the other tests are not useful. Faecal calprotectin is not useful in this scenario.

A 79 year old man with a previous CVA attends A&E. He is percutaneous endoscopic gastrostomy (PEG) fed and his PEG tube has “fallen out” 45 minutes ago after it got caught in his clothing, whilst using the toilet. Unfortunately, the PEG tube fell into the toilet pan but Mr. Jones has brought it with him “incase it can be sterilized”. He is otherwise well:

What is the best management plan?

- Arrange for CCSD to sterilize the old PEG and re insert it
- Arrange for the gastroenterologists to insert a new PEG through a new tract
- Insert a new PEG tube using the kit from endoscopy
- Reassure the patient that the gastroenterology team will be able to use the same tract in the morning and not to put anything down the PEG tract
- Insert a foley catheter into the tract to ensure the tract stays open

gastroenterologists to insert a new PEG through a new tract

Insert a new PEG tube using the kit from endoscopy 7%

Reassure the patient that the gastroenterology team will be able to use the same tract in the morning and not to put anything down the PEG tract 12%

Insert a foley catheter into the tract to ensure the tract stays open ✔ 75%

Correct answer selected

PEG tubes are fitted endoscopically and cannot be re-inserted (especially after toilet exposure!) therefore a new peg kit would not be an option. A balloon gastrostomy is a viable alternative not listed here. A foley catheter prevents the peg tract from closing (which can happen within 4 hours) and allows the safe re-insertion of a balloon gastrostomy the next day. Using the same tract is desirable as it avoids and invasive procedure and the risks of forming a new tract.

A 24 year old plumber with Ulcerative colitis presents with severe rectal bleeding. He is opening his bowels over 20 times a day including at least five times at night, passing only blood and mucous. He is also complaining of generalized abdominal pain.

On examination he looks unwell. His observations are:

| | |
|---|---|
| Heart rate | 105 beats per minute |
| Blood pressure | 105/78 mmHg |
| Respiratory rate | 26 breaths per minute |
| Temperature | 36.8 degrees Celsius |

His abdomen is markedly tender in the left iliac fossa but soft.

His blood tests show:

| | | |
|---|---|---|
| Haemoglobin | 9.8 | Normal range (130-180 g/l) |
| White cell count | 13.8 | Normal range (4.0-11.0 $x10^9$/L) |
| Mean cell Volume | 84 | Normal range (80-100 fL) |
| Platelets | 482 | Normal range (150-400 $x10^9$/L) |
| C reactive protein | 98 | Normal range (<3 mg/l) |

Which of the following is the most urgent initial investigation?

- ○ Abdominal CT
- ○ Abdominal x ray
- ○ Faecal Calprotectin
- ○ Stool microscopy culture and sensitivity
- ○ Urgent Flexible sigmoidoscopy

A 38 year old Asian man is admitted with shortness of breath. He has a background of ulcerative colitis and recently had a moderately severe flare during which he was commenced on 2 weekly infusions of Infliximab. Over the last 48 hours he has become increasingly unwell with cough and fever. His other medication includes Mesalazine 4.8g daily. He has no known allergies He is otherwise fit and well.

His observations are as follows:

HR 105 bpm

BP 108/64 mmHg

RR 23/min

Temp 36.9C

On examination there are bilateral crackles throughout the chest.

His chest radiograph shows widespread small nodular opacities distributed throughout the lung.

What is the best antibiotic(s) to commence in this gentleman?

- ○ Amoxicillin and Clarithromycin
- ○ Co-Trimoxazole
- ○ Doxycycline
- ○ Rifampicin, Isoniazid, Ethambutol and Pyrazinamide
- ○ Tazocin

Peer responses

Double mesalazine dose to 4.8g 25%

Correct answer

Reassure and advise to continue mesalazine at current dose 8%

Start Azathioprine at 50mg daily, then titrate up to target weight based dose after 2 weeks 5%

Start Intravenous Hydrocortisone 19%

Start Prednisolone 30mg daily 43%

Incorrect answer selected

Mild to moderate ulcerative colitis flares can often be managed with increased doses of mesalazine in the first instance. This avoids the need for corticosteroids and their subsequent side effects.

Start N acetyl cysteine 2%

Start ursodeoxycholic acid 5%

Urgent gastroenterology/hepatology review and liaise with obstetric team for early delivery of baby ✔ Correct answer selected 91%

This lady has acute fatty liver disease of pregnancy. It is a life threatening condition, thought to be related to HELLP syndrome. It can be difficult to diagnose as patients often have vague symptoms. The management is prompt delivery of the baby and supportive care to the mother. The Swansea criteria can be used to aid diagnosis and is described below.

Paracetamol levels form part of the liver screen, but the history is not suggestive of overdose. This patient should be kept as an inpatient and not discharged.

N-acetyl cysteine is used in paracetamol overdose, and ursodeoxycholic acid can be used in obstetric cholestasis.

started on oral omeprazole. When should the anti-platelet therapy be restarted?

Peer responses

| | |
|---|---|
| Day 5 ✔ Correct answer selected | 81% |
| Day 30 | 12% |
| Day 90 | 1% |
| Day 180 | 1% |
| Do not re-start antiplatelet agents | 5% |

In patients with UGI bleeding related to antiplatelet therapy induced ulceration it is important to assess the risk benefit of stopping the drugs and increased risk of a coronary event. Studies have shown that these patients are at a high risk of ACS and hence it is recommended that anti-platelet therapy should be recommenced at the earliest opportunity once the acute GI bleeding has settled and the patient is stable.

A 29-year-old woman who is 35 weeks' pregnant (gravida 3 para 2) presents with nausea, vomiting and anorexia. She has noticed a change in her eyes and her GP is concerned that she may be jaundiced. She has previously been fit and well. She takes no medications other than folic acid. She has otherwise had an uneventful pregnancy and was looking forward to the birth.

Her observations are as follows:

HR 110 bpm

BP 111/76 mmHg

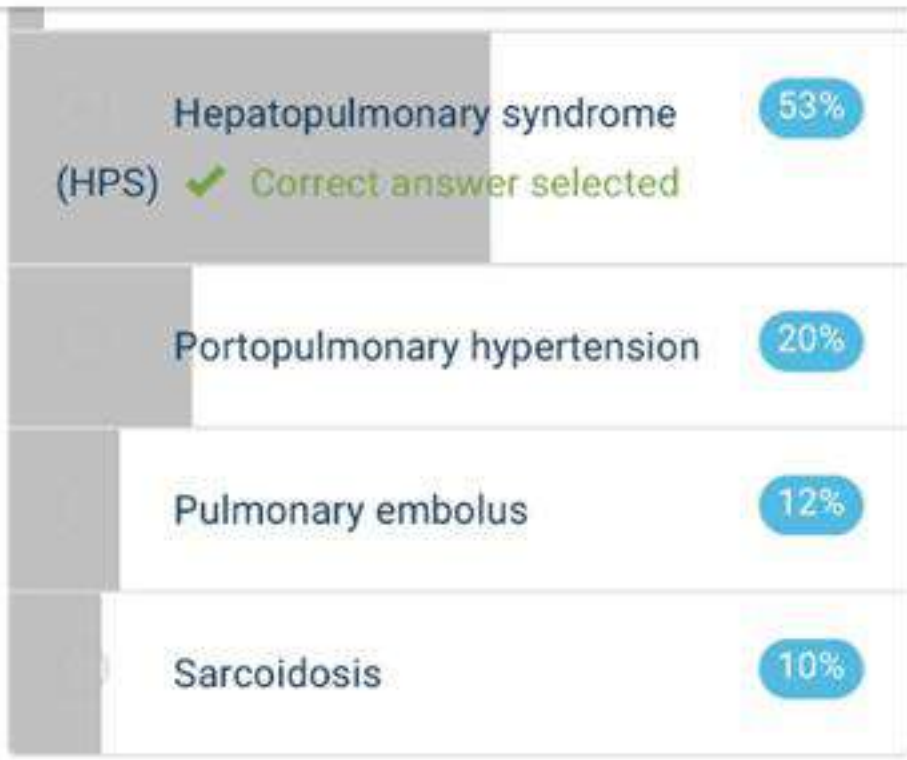
RR 25/min

Temp 36.4C

On examination, she was jaundiced with a gravid uterus. There was no evidence of ascites or stigmata of chronic liver disease.

Her blood results are as follows:

| | | |
|---|---|---|
| Haemoglobin | 12.1 | Normal range (130-180 g/l) |
| White cell count | 16.0 | Normal range (4.0-11.0 x$10^9$/L) |
| Mean Cell Volume | 88 | Normal range (80-100 fL) |
| Platelets | 99 | Normal range (150-400 x$10^9$/L) |
| Bilirubin | 90 | Normal range (<21 umol/L |
| Alkaline phosphatase | 880 | Normal range (30-150 U/L) |
| Alanine | 450 | Normal range (<59 |




Cirrhotic patients are at increased risk of specific abnormalities of pulmonary mechanics, haemodynamics, and ventilation-perfusion matching that can adversely affect both quality of life and longevity. Two of the most common pulmonary manifestations of cirrhosis are alterations in lung mechanics caused by the presence of ascites and intrapulmonary shunting and abnormal gas exchange, which together constitute HPS. HPS is defined as a widened age-corrected alveolar-arterial oxygen gradient (AaPO2) of room air in the presence or absence of hypoxemia (AaPO2 >15 mm Hg or >20 mm Hg in patients older than 64 years of age) as a result of intrapulmonary vasodilation.

Classic clinical manifestations of HPS include platypnea (dyspnea worsened by an erect position and improved by a supine position), orthodeoxia (exacerbation of hypoxia and hypoxemia in the upright position), an insidious onset and slow progression of dyspnea, clubbing, and distal cyanosis.

The diagnosis of HPS requires a high degree of clinical suspicion, measurement of arterial blood gases, detection of intrapulmonary shunting, and exclusion of intrinsic cardiopulmonary disease as the cause of hypoxemia.

The most sensitive test for the diagnosis of intrapulmonary shunting is contrast echocardiography. Treatment options for HPS are limited. Patients with well-preserved hepatic synthetic function who have hypoxemia are generally treated symptomatically until oxygenation worsens sufficiently to permit listing for liver transplantation.

A 55-year-old Afro-Caribbean woman with cryptogenic cirrhosis notes progressive exertional dyspnea, despite being fully compliant with a salt-restricted diet and a high-dose diuretic medication regimen.

Her saturations are 92% while sitting and 88% when standing. The results of her cardiac and respiratory system examinations are normal, she has minimal ascites and trace ankle edema, and her weight has been stable over the past several months.

Which of the following is the most likely diagnosis?

- Hepatic hydrothorax
- Hepatopulmonary syndrome (HPS)
- Portopulmonary hypertension
- Pulmonary embolus
- Sarcoidosis

Refer to Gastroenterologist as an urgent patient ✔ Correct answer selected 33%

This patient most likely has Pelvic radiation disease caused by her previous radiotherapy. Pelvic radiotherapy causes a permanent change in bowel habit in over 90% of patients. The pathophysiology is initially inflammatory, but after the first 3 months the disease process changes to a fibrotic disorder with neovascularization. This can lead to a wide variety of disorders including bile acid malabsorption, bacterial overgrowth, carbohydrate intolerances and recurrence of underlying malignancy. Given the relative longevity of symptoms, the normal blood tests and the lack of blood in the stool, this patient can be investigated as an outpatient. Her age coupled with a change in her bowel habit mandates that she is referred for an urgent colonoscopy, but these patients often need further investigations therefore urgent referral to a gastroenterologist is the best option. These patients can have severe symptoms need review by a gastroenterologist and outpatient follow up.

A 62 year old woman is referred to the medical intake with tingling and paraesthesia. The patient has been aware of deteriorating symptoms for one week. The GP asks whether this is a stroke. She has a background history of type 2 diabetes, hypertension and GORD for which she takes omeprazole, metformin, sitagliptin, simvastatin, Ramipril and amlodipine. On examination there is little of note.

Investigations reveal:

| | |
|---|---|
| Calcium | 2.06 mmol/l (2.2-2.6) |
| Magnesium | 0.3 mmol/l (0.7-1) |
| LFTs | Normal |

You see on the computer that a 25OHD level checked 1 month before by the GP reveals a level of 18 nmol/l (>50)

Which of the following is the likely cause of this patient's presentation?

- ○ Diabetic autonomic neuropathy
- ○ Metformin
- ○ Omeprazole
- ○ Sitagliptin
- ○ Vitamin D deficiency

| | |
|---|---|
| Amphetamines | 10% |
| Cocaine | 1% |
| Ecstasy (MDMA) | 21% |
| Ketamine | 12% |
| Psychedelic mushrooms ✔ | 57% |

Correct answer selected

This young man has developed acute liver failure as a likely consequence of the ingestion of a hepatotoxic drug. Such drugs include psychedelic mushrooms, anti-TB therapy, anticonvulsants and paracetamol. In this case the consumption of psychedelic mushrooms may well be the precipitant of acute liver failure with psilocybin mushrooms often being confused with amatoxin mushrooms, which can produce fatal hepatotoxicity.

A 21 year old male student is brought to A+E by his friends who have been increasingly concerned about him as he took a hallucinogenic substance the day before and had a 'bad trip'. Since then, he has become confused and drowsy. They do not know what substance he took but informs you that he has taken recreational drugs before.

On examination he is drowsy with a GCS of 12, blood pressure of 112/72 mmHg and a pulse of 110 bpm. He also has a liver flap. His oxygen saturations are 99% on air. There are no specific abnormalities on neurological examination.

His blood results reveal:

| | |
|---|---|
| FBC | Normal |
| U+Es | Normal |
| CRP | 55 mg/l (<5) |
| Bilirubin | 50 micromole/l (0-18) |
| Alkaline Phosphatase | 250 IU/l (50-110) |
| AST | 1500 IU/l (10-50) |
| ALT/td> | 1500 IU/l (10-500 |

Which of the following is the likely cause for his presentation?

- Amphetamines
- Cocaine
- Ecstasy (MDMA)
- Ketamine
- Psychedelic mushrooms

| | | |
|---|---|---|
| ○ | Anti-HBc IgA | 1% |
| ○ | Anti-HBc IgG | 4% |
| ○ | Anti-HBc IgM ← Correct answer | 57% |
| ○ | Anti-HBs | 7% |
| ○ | HBsAg | 31% |

The incubation period of HBV infection ranges from 60 to 180 days. The clinical presentation varies, from asymptomatic infection to cholestatic hepatitis with jaundice and, rarely, liver failure.

In patients with acute infection, HBsAg and markers of active viral replication (HBeAg and HBV DNA) become detectable approximately six weeks after inoculation, before the onset of clinical symptoms. Biochemical abnormalities usually coincide with the prodromal phase of the illness and may persist for several months. Anti-HBc IgM becomes detectable at symptom onset. Detectable levels of anti-HBc IgM may persist for many months, and detectable levels of anti-HBc IgG may persist for many years, if not a lifetime. Anti-HBs is the last serologic marker to become detectable, and it indicates that the infection is resolving. Anti-HBc IgA is not measured.

A 42-year-old woman presents with a three-week history of progressive fatigue, right upper quadrant discomfort, nausea, and jaundice. Her serum ALT level is 10 times the upper limit of normal. The presence of which of the following in a blood sample is most indicative of acute Hepatitis B virus (HBV) infection?

- Anti-HBc IgA
- Anti-HBc IgG
- Anti-HBc IgM
- Anti-HBs
- HBsAg

| | | |
|---|---|---|
| transferase | | U/L) |
| Prothrombin time | 10.2 | Normal range (9.0-13.0s) |
| Urea | 4.1 | Normal range (2.5-7.8 mmol/L) |
| Creatinine | 72 | Normal range (49-90 µmol/L) |

What is the appropriate management for this patient?

- (●) Admit to Gastroenterology ward
- ( ) Reassure and discharge back to the care of the GP
- ( ) Refer back to Oncologist
- ( ) Refer to Gastroenterologist as a routine patient
- ( ) Refer to Gastroenterologist as an urgent patient

A 68 year old woman presents with severe diarrhoea opening her bowels over 10 times per day for the last 2 months. She does not pass any blood and has not travelled, eaten in restaurants or have any other infective symptoms. She has seen her GP multiple times and is so frustrated that she has presented herself to the MAU. She received a course of radiotherapy for cervical cancer 8 months ago, but was previously entirely fit and well.

Examination is unremarkable, including rectal examination. She is not clinically or biochemically dehydrated. An abdominal x-ray is normal.

Her blood tests are as follows:

| | | |
|---|---|---|
| Haemoglobin | 13.8 | Normal range (130-180 g/l) |
| White cell count | 6.0 | Normal range (4.0-11.0 $x10^9$/L) |
| Mean Cell Volume | 98 | Normal range (80-100 fL) |
| Platelets | 203 | Normal range (150-400 $x10^9$/L) |
| Bilirubin | 18 | Normal range (<21 umol/L) |
| Alkaline phosphatase | 120 | Normal range (30-150 U/L) |
| Alanine transferase | 36 | Normal range (<59 U/L) |
| Prothrombin | 10.2 | Normal range (9.0- |

Ufone 12:20 AM 92%
studyprn.com

endoscopy required unless symptoms should ensue

Discharge and repeat endoscopy within the next week as an outpatient 21%

Repeat endoscopy as an inpatient within the next week ✖ Incorrect answer selected 9%

Repeat endoscopy as soon as possible as an inpatient ← Correct answer 49%

The assumed diagnosis is peptic ulceration due to aspirin use. He has had a life threatening GI bleed yet the source of this bleed has not been identified. He requires a repeat endoscopy as soon as possible, as, whilst the bleeding appears to have subsided, often a large clot can overlie a vessel and then this gets digested by stomach enzymes resulting in a further major bleed. Thus, guidance indicated that this man requires further endoscopy as an inpatient and in fact should have been performed within 24hrs where the cause of the bleeding has not been elucidated.

A 55 year old man was admitted with haematemesis and weakness. Over the last 2 days he had suffered from abdominal discomfort and anorexia. Today, he developed vomiting of dark blood. He had nothing of note in his past medical history. He was fit, having done triathlons in the past and usually took a 75mg aspirin a day, which was not prescribed but he took for his 'heart'. He took no other medication

On examination, he was pale with a pulse of 100 bpm and a blood pressure of 100/60 mmHg. His haemoglobin concentration was 80 mg/l (120-160). Coagulation and LFTs were normal. The suggested diagnosis was felt to be peptic ulceration due to aspirin use. He was told not to take NSAIDs. He was treated with IV omeprazole and resuscitated with Blood.

He underwent urgent endoscopy and the report indicated that the endoscopist could not see any source of bleeding as the stomach was full of blood.

Over the next 3 days, his clinical condition stabilised and he required 8 units of blood. His haemoglobin on day 3 was 102 g/dl. He had no further melaena or haematemesis. He was switched to oral omeprazole.

Which of the following is the next step in his management?

- ○ Discharge and arrange repeat endoscopy
- ○ Discharge and no further endoscopy required unless symptoms should ensue
- ○ Discharge and repeat endoscopy within the next week as an outpatient
- ○ Repeat endoscopy as an inpatient within the next week
- ○ Repeat endoscopy as soon as possible as an inpatient

Anaesthetic agent–induced hepatotoxicity ✖ Incorrect answer selected — 46%

Analgesic agent–induced hepatotoxicity — 2%

Haemolytic anemia? — 14%

Ischaemic hepatitis? — 2%

Postoperative cholestasis ← — 36%

Correct answer

Between 25% and 75% of patients undergoing surgery experience postoperative hepatic dysfunction, ranging from mild elevations in serum levels of liver enzymes to hepatic failure. Drugs that may cause hepatotoxicity in this setting include antibiotics and the halogenated anesthetic agents. Most produce injury by causing a hypersensitivity reaction that becomes evident within one to two weeks of administration.

Postoperative cholestasis is characterized by a short-latency elevation in the level of indirect bilirubin, lack of rash or eosinophilia, and ensured recovery.

A 20 year old female is admitted with nausea and vomiting which commenced after she ate a pizza approximately 4 hours earlier. She felt nauseous had some associated abdominal pain and developed profuse vomiting. She has been unable to keep anything down and has become weaker. She is 29 weeks pregnant with her second child and the pregnancy is doing well. Observations are generally fine, she seems slightly dehydrated yet investigations are normal. She is treated with an IV infusion of normal saline but is distressed by the vomiting.

Which of the following would be the most appropriate approach to managing the nausea and vomiting?

- Continue IV fluids only and no anti-emetics
- IV Dexamethasone
- IV Metoclopramide
- IV Ondansetron
- IV Prochlorperazine

Continue IV fluids only and no anti-emetics 12%

IV Dexamethasone 5%

IV Metoclopramide ← Correct answer 36%

IV Ondansetron ✖ Incorrect answer selected 24%

IV Prochlorperazine 22%

This young woman, who is in her second pregnancy, is likely to have acquired S Aureus food poisoning and is particularly symptomatic as a consequence. The most appropriate approach is to prescribe an antiemetic, and the drug with greatest safety data associated with its use in pregnancy is metoclopramide. Other recommended agents include antihistamines such as cyclizine.

A 71 year old gentleman presents to the acute medical team with fresh rectal bleeding following a bowel screening colonoscopy earlier that day where he said the endoscopist "sorted out my polyps on my rectum". He is still a bit drowsy from his sedation and is passing blood PR.

His observations are:

HR 105 bpm

BP 108/64 mmHg

RR 23/min

Temp 36.9C

What is the most likely cause of his symptoms?

- ○ Bowel prep related rectal bleeding
- ○ Colonic perforation
- ○ Diverticular bleed
- ○ Haemorrhoid irritation post colonoscopy
- ○ Polypectomy bleed

Peer responses

- Bowel prep related rectal bleeding 2%
- Colonic perforation 11%
- Diverticular bleed 7%
- Haemorrhoid irritation post colonoscopy 4%
- Polypectomy bleed ✔ Correct answer selected 76%

Polypectomy bleeding occurs in 1.0-6.1% of all colonoscopic polypectomies and patients are warned that bleeding is a risk. Bowel screening colonoscopies have a high adenoma detection rate and a large number of often large polypectomies are performed; therefore the risk and frequency of bleeding is increased. The team should liaise with the endoscopist, surgical team and interventional radiology.

Pentoxifylline 9%

Prednisolone ✔ Correct answer 65%

selected

Prednisolone and pentoxifylline 10%

Supportive management 9%

The recent STOPAH study compared prednisolone and pentoxifylline in a double-blinded randomized controlled trial. Although judged to be underpowered, the study did show an improvement in 28-day mortality with prednisolone, but not with pentoxifylline. The improvements were not seen at 90 days or 1 year. A discriminant function score is useful in predicting short term prognosis with a score above 32 suggesting a poorer prognosis and that the patient may benefit from steroid therapy.

A 40 year old woman with known alcoholic liver disease presents with jaundice.

Her blood results are as follows:

| | |
|---|---|
| Alkaline phosphatase | 480 iu/l (50-110) |
| AST | 106 iu/l (0-50) |
| Bilirubin | 130 micromol/l (0-20) |
| Prothrombin time | 21s (11-15) |

Her Maddrey's discriminant functions score is 35.

Which of the following is the best treatment to improve her 30 day mortality?

- N Acetyl cysteine
- Pentoxifylline
- Prednisolone
- Prednisolone and pentoxifylline
- Supportive management

# Maddrey's Discriminant Function for Alcoholic Hepatitis

Suggests which patients with alcoholic hepatitis may have a poor prognosis and benefit from steroid administration.

Favorite ★

Pearls/Pitfalls ^

Maddrey's Discriminant Function is useful in predicting short-term prognosis but is less useful for long-term prognosis.

| | | |
|---|---|---|
| PT | Norm: 11 - 13 | sec |
| PT control/reference level | Norm: 11 - 13 | sec |
| Total bilirubin | Norm: 5.13 - 32.49 | µmol/L ⇆ |

## Result:

**Please fill out required fields.**

A 36-year-old man is evaluated for treatment of hepatitis C. He has not received interferon-based therapy, but is currently taking a complementary alternative medicine (CAM), the name of which he cannot recall. The patient's blood pressure is 156/92 mm Hg, and he has 1+ bilateral lower extremity edema. Laboratory studies are performed, and later that night, the laboratory calls because the serum potassium level is 2.6 mmol/L (3.5-5). The patient takes no other medication and has no history of hypokalemia. You suspect that the patient is taking which of the following?

- Chinese herbal medicine
- Glycyrriza glabra (licorice)
- Silymarin (milk thistle)
- St John's Wort
- Thymic extract

Glycyrriza glabra (licorice) ✔ 66%

Correct answer selected

Silymarin (milk thistle) 13%

St John's Wort 13%

Thymic extract 2%

All of these complementary alternative medications have been associated with adverse events. Licorice inhibits 11-ß-hydroxysteroid dehydrogenase, and this may lead to a pseudoaldosterone effect resulting in hypokalemia, sodium retention, and hypertension.

Multiple adverse events have been reported with milk thistle, but the most important relates to its ability to inhibit CYP3A4 and uridine diphospho glucuronosyl transferase. This may lead to interactions with traditional prescription medications such as quinine, lidocaine, certain calcium channel–blocking agents, and cyclosporine, all of which are metabolized in part by CYP3A4.

Chinese herbal medicine has been associated with possible hepatotoxicity, as well as pneumonitis, autoimmune hepatitis, and acute thrombocytopenic purpura.

St John's wort has been shown to cause multiple drug interactions through induction of the cytochrome P450 enzymes CYP3A4 and CYP1A2. This drug-metabolizing enzyme induction results in the increased metabolism of certain drugs, leading to decreased plasma concentration and potential clinical effect

Finally, thymic extract has been reported to cause nausea, vomiting, and, rarely, thrombocytopenia.

**Text Box 1**

**The original Kings College Criteria for poor prognosis in Acute Liver Failure.**

**Paracetamol:** P-Paracetamol-PH

pH<7.3 (irrespective of grade of encephalopathy)
or
Prothrombin time >100 s and serum creatinine >300 μmol/L
In patients with grade III or IV encephalopathy.

**Non-paracetamol:** Np-iNr-PT 👍

Prothrombin time >100 s (irrespective of grade of encephalopathy)
Or
Any 3 of the following variable (irrespective of grade of encephalopathy)
Age <10 or > 40 years
Etiology –non A, non B hepatitis, halothane hepatitis, idiosyncratic drug reactions
Duration of jaundice before onset of encephalopathy >7 days
Prothrombin time >50 s
Serum Bilirubin >300 μmol/L
Source: O'Grady et al.

Current UK ALF Transplant wait listing criterial found at http://odt.nhs.uk/pdf/liver_selection_policy.pdf

A 57 year old teacher presents acutely to the medical assessment unit with a 6 hour history of haematemesis and melaena. He has known osteoarthritis for which he takes regular Naproxen but is otherwise fit and well. He is on no other medication and does not drink alcohol.

On examination he is pale and looks unwell.

**His observations are:**

Heart rate 105 beats per minute

Blood pressure 105/78 mmHg

Respiratory rate 26 breaths per minute

On examination he has marked epigastric tenderness and Maleana on rectal examination.

Which one of the following risk stratification scores is best to use as part of your initial assessment to assess the patient's mortality risk and the urgency and location (inpatient versus outpatient) for endoscopy?

- Discriminant Function
- Forrest Classification
- Glasgow Blatchford score
- Post endoscopy Rockall score
- Pre endoscopy Rockall Score

## Table 30-3 Blatchford Score*

| ADMISSION RISK MARKER | SCORE COMPONENT VALUE |
|---|---|
| Blood urea nitrogen level (mg/dL) | |
| ≥18.2 to <22.4 | 2 |
| >22.4 to <28 | 3 |
| >28 to <70 | 4 |
| >70 | 6 |
| Hemoglobin level for men (g/dL) | |
| >12 to <13 | 1 |
| ≥10 to <12 | 3 |
| <10 | 6 |
| Hemoglobin level for women (g/dL) | |
| ≥10 to <12 | 1 |
| <10 | 6 |
| Systolic blood pressure (mm Hg) | |
| ≥100 to <109 | 1 |
| >90 to <99 | 2 |
| <90 | 3 |
| Other markers | |
| Pulse rate ≥100 beats/min | 1 |
| Presentation with melena | 1 |
| Presentation with syncope | 2 |
| Hepatic disease | 2 |
| Heart failure | 2 |

*Range of scores is from 0 to 23 with high risk greater than 0.

The Glasgow Blatchford score is a screening tool used to assess the probability that a patient with a suspected upper GI bleed will need to undergo an intervention such as an endoscopy or blood transfusion. It lacks subjective variables (such as the severity of comorbid disease) or the requirement of upper GI endoscopy pre scoring making it superior to Rockall scoring in the acute environment. In a controlled study 16% of patients with suspected upper GI bleeding had a GBS of 0. There were no deaths or adverse interventions required in these patients and as such these patients can be managed in an outpatient setting.

Rockall scoring is based partly on endoscopic appearances, making it less useful during a patient's acute presentation.

The Forrest Classification is used to grade a bleeding lesion at time of endoscopy to evaluate the risk of re-bleeding.

The Discriminant function is a scoring system used in alcoholic hepatitis to evaluate both the mortality risk and the requirement for treatment with corticosteroids.

A 42 year old lady with chronic liver disease presents unwell to the A&E with diarrhea and vomiting. You are asked to see her due to her history of liver disease. Her diarrhoeal symptoms are settling but you are concerned about acute kidney injury. Her blood tests are as follows:

| | Current results | 2 months ago |
|---|---|---|
| Sodium | 130 mmol/l (134-144) | 137 |
| Potassium | 2.9 mmol/l (3.5-5) | 3.8 |
| Creatinine | 82 micromol/l (50-100) | 61 |
| Urea | 5 mmol/l (3-8) | 2.9 |

At what stage is her acute kidney injury?

- ○ No acute kidney injury as creatinine normal
- ○ Stage 1
- ○ Stage 2
- ○ Stage 3
- ○ Stage 4

| Variables | Responses | Scores |
|---|---|---|
| **Age (in years)** | < 60 | 0 |
| | 60-79 | 1 |
| | >80 | 2 |
| **Shock** | No shock | 0 |
| | Tachycardia (SBP > 100 mmHg, Pulse > 100 beats/minute) | 1 |
| | Hypotension (SBP < 100 mmHg, Pulse > 100 beats/minute) | 2 |
| **Co-morbidity** | None | 0 |
| | Cardiac failure, IHD, any major co-morbidity | 2 |
| | Renal/liver failure, metastatic malignancy | 3 |
| **Diagnosis (post-endoscopy)** | Mallory-Weiss tears | 0 |
| | All other diagnoses | 1 |
| | Malignancy of the upper GI tract | 2 |

Rockall scoring is based partly on endoscopic appearances, making it less useful during a patient's acute presentation.

| RIFLE class | AKIN category | Serum creatinine criteria | Urine output criteria |
|---|---|---|---|
| Risk | 1 | An increase of ≥26.4 μmol/l (≥0.3 mg/dl)<br>OR<br>An increase of ≥150–200% (1.5- to 2-fold) from baseline | <0.5 mg/kg/h for at least 6 h |
| Injury | 2 | An increase of ≥200–300% (2- to 3-fold) from baseline | <0.5 mg/kg/h for at least 12 h |
| Failure | 3 | An increase of ≥300% (>3-fold) from baseline<br>OR<br>Serum creatinine ≥354 μmol/l (≥4.0 mg/dl) with an acute rise of at least 44 μmol/l (≥0.5 mg/dl)<br>OR<br>Initiation of RRT | <0.3 mg/kg/h for at least 24 h<br>OR<br>Anuria for >12 h |

| AKI grade | AKI description | Serum creatinine level | Creatinine change | History, physical examination |
|---|---|---|---|---|
| 0 | No AKI | <140 μmol/L (<1.6 mg/dL) | < 26.4 μmol/L (<0.3 mg/dL) | No clinical, laboratory or diagnostic imaging signs of AKI |
| 1 | Nonazotemic AKI | <140 μmol/L (<1.6 mg/dL) | >26.4 μmol/L (>0.3 mg/dL) increase within 48 hour | Any clinical, laboratory or diagnostic imaging sign of AKI, oliguria, or anuria >6 hour |
| 2 | Mild AKI | 141–220 μmol/L (1.7–2.5 mg/dL) | >26.4 μmol/L (>0.3 mg/dL) within 48 hour | Documented AKI, static or progressive azotemia, oliguria, or anuria >6 hour |
| 3 | Moderate to severe AKI | 221–439 μmol/L (2.6–5.0 mg/dL) | | Documented AKI |
| 4 | | 440–880 μmol/L (5.1–10.0 mg/dL) | | |
| 5 | | >880 μmol/L (>10 mg/dL) | | |

AKI, acute kidney injury.

Ufone 1:38 PM 17%
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- Fibroscan 5%
- MRCP 0%
- Ultrasound abdomen with portal vein Doppler ✔ Correct answer selected 84%
- Upper GI endoscopy for varices surveillance 3%

This patient clearly has decompensated alcoholic liver disease with ascites. Their initial management should include stabilisation, prevention of acute inpatient alcohol withdrawal and investigation of potential causes of deterioration. These causes include but are not limited to Infection such as spontaneous bacterial peritonitis (SBP), Alcoholic hepatitis, Gastrointestinal bleeding and Portal vein thrombosis. In this scenario, and ultrasound is the only listed option that would form part of your management plan (along with other tests)

A diagnostic tap is not contraindicated with high prothrombin time. It is a vital part of the initial workup and with correct technique is safe even in patients with a high prothrombin time. Diazepam is a benzodiazepine commonly prescribed for alcohol withdrawal. The risks of seizure in these patients are high and regimens such as the Clinical Institute Withdrawal Assessment for Alcohol (CIWA) should be used routinely

Serum ammonia level can be used to assess the presence of encephalopathy, but is not an accurate tool and cannot evaluate the severity of encephalopathy

In alcoholic liver disease the ALT rarely rises above 400, and is not a marker of severity of disease. Clotting screens are more useful in this regard as they represent the synthetic function of the liver.

Next Exit

Stage 1 ✔ Correct answer 36%

selected

Stage 2 9%

Stage 3 1%

Stage 4 1%

Patients with chronic liver disease often have a lower creatinine due to decreased synthetic function of the liver. As such, creatinine and urea levels in patients with chronic liver disease should always be compared to previous results in possible, and as such 'normal range' results may represent a significant kidney injury for these patients. In this case there has been over a 1.5 fold increase in creatinine therefore this fits with a stage 1 AKI. There is no stage 4 AKI according to the modified RIFLE criteria.

**Modified RIFLE AKIN criteria**

| Stage | Serum Creatinine (µmol/l) | Urine output (ml/kg/hr) |
|---|---|---|
| 1 | >26.4 µmol/l or >150-200% of baseline | <0.5 for >6hrs |
| 2 | >200-300% of baseline | <0.5 for >12hrs |
| 3 | >300% of baseline or >44 µmol/l from 354 | <0.3 for 24 hrs or Anuria for 12 hrs |

A 48 year old unemployed lady is referred to the medical assessment unit by her general practitioner with a 2 week history of abdominal swelling. She is known to have a history of alcohol abuse and continues to drink around 80 units of alcohol per week. She has no other medical history and lives alone at home.

On examination she is jaundiced and slightly drowsy. She has palmar erythema and multiple spider naevi. She has marked abdominal swelling with shifting dullness, but her abdomen is otherwise soft and non tender.

Her blood results are as follows:

| | | |
|---|---|---|
| Haemoglobin | 12.1 | Normal range (130-180 g/l) |
| White cell count | 6.0 | Normal range (4.0-11.0 x$10^9$/L) |
| Mean Cell Volume | 108 | Normal range (80-100 fL) |
| Platelets | 98 | Normal range (150-400 x$10^9$/L) |
| Bilirubin | 45 | Normal range (<21 umol/L) |
| Alkaline phosphatase | 180 | Normal range (30-150 U/L) |
| Alanine transferase | 280 | Normal range (<59 U/L) |
| Prothrombin time | 20.2 | Normal range (9.0-13.0 SEC) |

What is the most appropriate test to perform next?

- ○ CT abdomen/pelvis
- ○ Fibroscan
- ○ MRCP
- ○ Ultrasound abdomen with portal vein Doppler
- ○ Upper GI endoscopy for varices surveillance

A 64 year old man with known alcohol abuse presents to A&E. He has had frank haematemesis for the last 4 hours. On presentation his observations are

HR 130 bpm

BP 89/64 mmHg

RR 28/min,/p>

Temp 36.9C

You secure intravenous access, and send bloods for analysis. While you await blood results you give him intravenous fluids plus 2mg terlipressin.

His blood results show;

| | | |
|---|---|---|
| Haemoglobin | 8.1 | Normal range (130-180 g/l) |
| White cell count | 6.0 | Normal range (4.0-11.0 $x10^9$/L) |
| Mean Cell Volume | 108 | Normal range (80-100 fL) |
| Platelets | 59 | Normal range (150-400 $x10^9$/L) |

Despite your initial management there is no improvement and he continues to have large volume haematemesis. You contact the gastroenterologist at home but there is no on call GI bleeding rota, and he is away from home therefore it will be some time before he can perform an endoscopy.

What is the next best management option?

- ○ Insert sengstaken tube and inflate esophageal balloon
- ○ Insert sengstaken tube and inflate gastric balloon
- ○ Insert sengstaken tube and insert both gastric and esophageal balloons
- ○ Intravenous proton pump inhibitor
- ○ Repeat terlipressin 2mg IV

A 68 year old man was admitted with haematemesis. He had gone out the evening before and had drunk too much alcohol at a wedding party. He vomited in the early hours and then on the last couple of occasions vomited frank blood. He vomited blood on two occasions, the last of which was 2 hours ago. His wife brought the pillow cloth on which he vomited, which shows dark blood staining. He had nothing of note in his past medical history other than type 2 diabetes and hypertension, for which he takes metformin, ramipril, simvastatin and clopidogrel.

On examination, he was subdued with a pulse of 68 bpm and a blood pressure of 116/60 mmHg. His haemoglobin concentration was 116 mg/l (120-160). Coagulation and LFTs were normal. His urea is normal at 4 mmol/l and creatinine is also reported normal As part of the management plan, clopidogrel was stopped. The admitting doctor calculates his Blatchford score to be 3.

Which of the following is the most appropriate approach to the management of this patient?

- ○ Admit and arrange immediate endoscopy
- ○ Admit and arrange endoscopy within 24 hrs
- ○ Admit and monitor without necessarily arranging endoscopy unless clinical condition deteriorates
- ○ Commence oral PPI, discharge if clinical observations stable over view to outpatient endoscopy (within 1 week)
- ○ Discharge in about 4 hours if no further haematemesis has occurred and observations stable with no requirement for future endoscopy

Admit and arrange endoscopy within 24 hrs ✔ Correct answer selected — 52%

Admit and monitor without necessarily arranging endoscopy unless clinical condition deteriorates — 17%

Commence oral PPI, discharge if clinical observations stable over view to outpatient endoscopy (within 1 week) — 15%

Discharge in about 4 hours if no further haematemesis has occurred and observations stable with no requirement for future endoscopy — 8%

In this man's case, he has had a witnessed haematemesis and he is over 60 giving a Rockall score of 1. His Blatchford score is 3 thus putting him in a high risk category. NICE recommends calculating Blatchford score for all patients admitted with UGI bleed pre-endoscopy and early discharge should only be considered for patients with a pre-endoscopy Blatchford score of 0.

The most likely diagnosis here is a Mallory-Weiss tear from the description but even so, the guidelines suggest that this man should be admitted and, where possible have an endoscopy performed within 24 hrs. According to NICE one should offer endoscopy to unstable patients with severe acute upper gastrointestinal bleeding immediately after resuscitation and within 24 hours of admission to all other patients with upper gastrointestinal bleeding. There is no evidence that commencing a PPI before endoscopy would have any prognostic benefit.

NICE Clinical guideline CG141. 2012. Acute upper gastrointestinal bleeding in over 16s: management

Ufone 2:08 PM 13%
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Insert sengstaken tube and inflate esophageal balloon ✖ Incorrect answer selected — 26%

Insert sengstaken tube and inflate gastric balloon ← Correct answer — 24%

Insert sengstaken tube and insert both gastric and esophageal balloons — 36%

Intravenous proton pump inhibitor — 6%

Repeat terlipressin 2mg IV — 8%

PPI and terlipressin is unlikely to rescue this gentleman and he needs endoscopic therapy. If this is unavailable a sengstaken tube is an effective way to manage variceal bleeding. Only the gastric balloon should be used as gastric varices fill from the stomach upwards, and the oesophageal balloon can cause significant mucosal necrosis and further bleeding.

**Further Reading**

CT scan of the abdomen 9%

Endoscopic retrograde cholangiopancreatoscopy (ERCP) ✖ 28%

Incorrect answer selected

Magnetic resonance cholangiopancreatography (MRCP) ← 56%

Correct answer

MRI liver 1%

Serum liver screen including autoimmune antibodies 7%

This is a non-invasive test which is excellent for diagnosing the cause of obstructive jaundice. Her history of ulcerative colitis raises the question of possible PSC, which a CT will not rule out effectively. Blood tests should be sent but the MRCP will give you the diagnosis. ERCP should not ideally be used for diagnosis alone and it is an invasive procedure with a 1:50 risk of pancreatitis.

| AKI grade | AKI description | Serum creatinine level | Creatinine change | History, physical examination |
|---|---|---|---|---|
| 0 | No AKI | <140 μmol/L (<1.6 mg/dL) | < 26.4 μmol/L (<0.3 mg/dL) | No clinical, laboratory or diagnostic imaging signs of AKI |
| 1 | Nonazotemic AKI | <140 μmol/L (<1.6 mg/dL) | >26.4 μmol/L (>0.3 mg/dL) increase within 48 hour | Any clinical, laboratory or diagnostic imaging sign of AKI, oliguria, or anuria >6 hour |
| 2 | Mild AKI | 141–220 μmol/L (1.7–2.5 mg/dL) | >26.4 μmol/L (>0.3 mg/dL) within 48 hour | Documented AKI, static or progressive azotemia, oliguria, or anuria >6 hour |
| 3 | Moderate | 221–439 μmol/L (2.6–5.0 mg/dL) | | Documented AKI |
| 4 | to severe AKI | 440–880 μmol/L (5.1–10.0 mg/dL) | | |
| 5 | | >880 μmol/L (>10 mg/dL) | | |

AKI, acute kidney injury.

A 56 year old woman presents to the MAU with jaundice. She has noticed increased jaundice over the last week and has recently lost weight. The weight loss has been a deliberate effort as she was previously obese. She feels generally unwell. Her only past medical history is of ulcerative colitis, for which she takes mesalazine.

Her blood results show;

| | | |
|---|---|---|
| Haemoglobin | 12.1 | Normal range (130-180 g/l) |
| White cell count | 4.1 | Normal range (4.0-11.0 x$10^9$/L) |
| Mean cell Volume | 79 | Normal range (80-100 fL) |
| Platelets | 161 | Normal range (150-400 x$10^9$/L) |
| Bilirubin | 145 | Normal range (<21 umol/L) |
| Alkaline phosphatase | 480 | Normal range (30-150 U/L) |
| Alanine transferase | 180 | Normal range (>59 U/L |

You arrange an ultrasound scan of her abdomen. The report shows

"There is dilatation of the common bile duct and intrahepatic biliary ducts. The pancreas is obscured by bowel gas. The liver appears bright but the scan is limited due to body habitus".

What is the next test you should perform?

- ○ CT scan of the abdomen
- ○ Endoscopic retrograde cholangiopancreatoscopy (ERCP)
- ○ Magnetic resonance cholangiopancreatography (MRCP)
- ○ MRI liver
- ○ Serum liver screen including autoimmune antibodies

| Variables | Responses | Scores |
|---|---|---|
| **Age (in years)** | < 60 | 0 |
| | 60-79 | 1 |
| | >80 | 2 |
| **Shock** | No shock | 0 |
| | Tachycardia (SBP > 100 mmHg, Pulse > 100 beats/minute) | 1 |
| | Hypotension (SBP < 100 mmHg, Pulse > 100 beats/minute) | 2 |
| **Co-morbidity** | None | 0 |
| | Cardiac failure, IHD, any major co-morbidity | 2 |
| | Renal/liver failure, metastatic malignancy | 3 |
| **Diagnosis (post-endoscopy)** | Mallory-Weiss tears | 0 |
| | All other diagnoses | 1 |
| | Malignancy of the upper GI tract | 2 |

## Table 30-3 Blatchford Score*

| ADMISSION RISK MARKER | SCORE COMPONENT VALUE |
|---|---|
| Blood urea nitrogen level (mg/dL) | |
| ≥18.2 to <22.4 | 2 |
| >22.4 to <28 | 3 |
| >28 to <70 | 4 |
| >70 | 6 |
| Hemoglobin level for men (g/dL) | |
| >12 to <13 | 1 |
| ≥10 to <12 | 3 |
| <10 | 6 |
| Hemoglobin level for women (g/dL) | |
| ≥10 to <12 | 1 |
| <10 | 6 |
| Systolic blood pressure (mm Hg) | |
| ≥100 to <109 | 1 |
| >90 to <99 | 2 |
| <90 | 3 |
| Other markers | |
| Pulse rate ≥100 beats/min | 1 |
| Presentation with melena | 1 |
| Presentation with syncope | 2 |
| Hepatic disease | 2 |
| Heart failure | 2 |

*Range of scores is from 0 to 23 with high risk greater than 0.

The Glasgow Blatchford score is a screening tool used to assess the probability that a patient with a suspected upper GI bleed will need to undergo an intervention such as an endoscopy or blood transfusion

Forrest Classification 0%

Glasgow Blatchford score ✔ 59%

Correct answer selected

Post endoscopy Rockall score 4%

Pre endoscopy Rockall Score 35%

The Glasgow Blatchford score is a screening tool used to assess the probability that a patient with a suspected upper GI bleed will need to undergo an intervention such as an endoscopy or blood transfusion. It lacks subjective variables (such as the severity of comorbid disease) or the requirement of upper GI endoscopy pre scoring making it superior to Rockall scoring in the acute environment. In a controlled study 16% of patients with suspected upper GI bleeding had a GBS of 0. There were no deaths or adverse interventions required in these patients and as such these patients can be managed in an outpatient setting.

Rockall scoring is based partly on endoscopic appearances, making it less useful during a patient's acute presentation.

The Forrest Classification is used to grade a bleeding lesion at time of endoscopy to evaluate the risk of re-bleeding.

The Discriminant function is a scoring system used in alcoholic hepatitis to evaluate both the mortality risk and the requirement for treatment with corticosteroids.

Hypermagnesemia 0%

Hyperphosphatemia 2%

Hypocalcemia 3%

Hypophosphatemia ✔ Correct 95%

answer selected

Patients with anorexia nervosa are at risk of refeeding syndrome, a potentially life-threatening condition characterized by fluid and electrolyte disorders including hypophosphatemia, hypomagnesemia, and hypokalemia. This syndrome typically occurs within four days of introducing a healthy diet to a patient with anorexia nervosa. As a shift from fat to carbohydrate metabolism occurs, insulin levels increase, leading to increased cellular uptake of phosphate. Associated with intracellular movement of electrolytes is a decrease in the serum electrolytes, particularly phosphate, potassium, magnesium, glucose, and thiamine. Alteration in serum calcium levels is not commonly associated with refeeding syndrome.

| | | |
|---|---|---|
| | Bilirubin | 13% |
| WBC count ✔ selected | Correct answer | 47% |

In acute pancreatitis, the Ranson criteria have been time-tested indicators of disease severity and prognosis. Ranson criteria include five admission criteria: (1) age older than 55, (2) WBC count greater than 16,000, (3) glucose level greater than 200 mg/dl (11.1 mmol/l), (4) lactate dehydrogenase level greater than 350 u/l, (5) AST level greater than 250, and five criteria determined at 48 hours: (1) hematocrit decrease more than 10, (2) BUN increase more than 5, (3) calcium less than 8, (4) PO2 less than 60, (5) base deficit more than 4. Amylase and lipase levels are not good predictors of disease severity or prognosis.

Inform public health, as Campylobacter spp is a notifiable disease ✔ 63%

Correct answer selected

Keep in hospital until stool culture is negative 0%

Screen other attendees at the barbeque for potential campylobacter infection 4%

Treat with oral ciprofloxacin 30%

Treat with oral metronidazole 3%

Campylobacter infection is a notifiable disease closely linked to eating undercooked chicken. Antibiotics can be used if diarrhoeal symptoms persist but are not required if symptoms have settled. There is no need to screen other attendees.

Lymphocyte count >250 cells/mm3 — 0%

Neutrophil count >150 cells/mm3 — 1%

Neutrophil count >250 cells/mm3 — 73%

✔ Correct answer selected

White cell count >150 cells/mm3 — 1%

White cell count >250 cells/mm3 — 25%

The other results are not diagnostic of SBP

It is important to effectively diagnoses and treat SBP as the consequences can be life threatening. The current UK guidelines suggest a diagnostic level of 250 neutrophils/mm3 as the cut off for SBP. If infection is confirmed, Broad spectrum antibiotics should be commenced, and albumin infusions are also often given.

A 64 year old gentleman presents with gross ascites. He has a background of cirrhosis due to hepatitis C from a previous blood transfusion in 1978. As part of his workup you perform a diagnostic ascitic tap to rule out spontaneous bacterial peritonitis

Which of the following is diagnostic of spontaneous bacterial peritonitis on ascitic fluid analysis?

- Lymphocyte count >250 cells/mm3
- Neutrophil count >150 cells/mm3
- Neutrophil count >250 cells/mm3
- White cell count >150 cells/mm3
- White cell count >250 cells/mm3

IgG related disease 7%

Ischemic hepatitis 2%

Wilson's disease ✔ Correct 52%

answer selected

Wilson's disease is most commonly diagnosed in children and young adults and should be suspected in this age group. This disorder results from a defect in the ATP7A gene and results in copper retention in the liver resulting in hepatocyte injury. Patients can present in various ways, from asymptomatic abnormalities in blood work to fulminant hepatic failure. Patients presenting with severe acute Wilson's disease are often noted to have hemolysis with an elevated hyperbilirubinemia and anemia resulting in jaundice. AST and ALT levels are often quite elevated compared with the alkaline phosphatase, which is either normal or below normal in acute settings. Patients presenting in this manner need to be diagnosed expeditiously and transferred to a liver transplantation facility as copper chelators are not beneficial in this setting.

A 17-year-old otherwise healthy girl notes that her urine has become darker than usual and she is having a difficult time concentrating in school. Routine blood tests show the following results.

| | |
|---|---|
| Haemoglobin level | 80 g/L (110-160) |
| Bilirubin | 9 micromol/l (<18) |
| Alkaline Phosphatase | 90 iu/l (50-110) |
| AST | 700 iu/l (10-50) |
| ALT | 890 iu/l (10-50) |

Hepatitis A/B/C serology results are negative.

Which is the most likely diagnosis?

- ○ Alcoholic hepatitis
- ○ Autoimmune hepatitis (AIH)
- ○ IgG related disease
- ○ Ischemic hepatitis
- ○ Wilson's disease

GLASGOW BLATCHFORD SCORE 0%

HASBLED SCORE ✔ Correct answer selected 85%

ROCKALL SCORE 5%

The HASBLED score will calculate the risk of major haemorrhage in 1 year in patients with atrial fibrillation. CHADS VASC and CHADS VASC 2 are used to evaluate risk of thrombotic stroke in atrial fibrillation. GBS and Rockall scores are used in GI bleeding.

| | Condition | Points |
|---|---|---|
| H | Hypertension: (uncontrolled, >160 mmHg systolic) | 1 |
| A | Abnormal renal function: Dialysis, transplant, Cr >2.26 mg/dL or >200 µmol/L Abnormal liver function: Cirrhosis or Bilirubin >2x Normal or AST/ALT/AP >3x Normal | 1 |
| S | Stroke: Prior history of stroke | 1 |
| B | Bleeding: Prior Major Bleeding or Predisposition to Bleeding | 1 |
| L | Labile INR: (Unstable/high INRs), Time in Therapeutic Range <60% | 1 |
| E | Elderly: Age > 65 years | 1 |
| B | Prior Alcohol or Drug Usage History (> 8 drinks/week) Medication Usage Predisposing to Bleeding: (Antiplatelet agents, NSAIDs) | 1 |

A 58 year old man was admitted with haematemesis. Over the last 2 days he had suffered from abdominal discomfort and anorexia. Today, he developed vomiting of dark blood. He had nothing of note in his past medical history other than type 2 diabetes treated with metformin. He also took simvastatin as a prescribed medication and aspirin 75mg daily. On examination, he was pale with a pulse of 110 bpm and a blood pressure of 106/60 mmHg.

Which of the following is this patient's initial Rockall score?

- 0
- 1
- 3
- 5
- 6

Ufone 11:34 PM 83%
studyprn.com

A 37 year old lady who had a cadaveric renal transplant 5 months ago presents to Accident and Emergency with complaints of fever, dry cough and worsening of shortness of breath over the last 4 days. She is known to have Alport's syndrome and has remained on peritoneal dialysis for 1 year. Her current medications include oral prednisolone, mycophenolate mofetil, tacrolimus, lisinopril and omeprazole.

On examination, she appears short of breath with a respiratory rate of 26/min and an oxygen saturation of 90% on 2 liters of oxygen. Her blood pressure is 140/90 mmHg with a temperature of 38°C. There is no pallor or pedal edema. Her chest auscultation reveals bilateral pan inspiratory coarse crackles. The rest of the examination is unremarkable.

Her investigations reveal:

| | | |
|---|---|---|
| Hb | 12.3 g/dl | 13-18 g/dl |
| WBC | 13.6 x $10^9$/l | 4-11 x $10^9$/l |
| Platelets | 133 x $10^9$/l | 150-300 x $10^9$/l |

A 76 year old man undergoes an upper GI endoscopy for dyspepsia. The findings are unremarkable and he is discharged home. However, he attends A&E 3hrs later that evening with a 1 hour history of acute, severe central chest pain associated with feeling hot and sweaty.

On examination, he appears in pain with a pulse of 98 bpm, a blood pressure of 148/88 mmHg and a temperature of 38.3C.

Which is the most appropriate investigation from the following list to confirm this gentleman's diagnosis?

- Barium swallow
- CXR
- ECG
- Gastrografin swallow
- Troponin

| | |
|---|---|
| Aspergillosis | 12% |
| Community acquired pneumonia | 4% |
| Pneumocystis jiroveci pneumonia ✔ Correct answer selected | 77% |
| Pulmonary tuberculosis | 6% |
| Sarcoidosis | 1% |

This patient with renal transplantation has now become acutely unwell with fever and chest infection. The timing of an infectious episode after transplantation is crucial in establishing a diagnosis. In the first one month after transplantation, usually infections related to the surgery itself or indwelling catheters like urinary tract infections are common. Whereas the most common time for opportunistic infections to occur secondary to immunosuppression is the 1-6 month period post-transplant, as encountered with this patient. Pneumocystis jiroveci pneumonia (PCP) is an opportunistic chest infection with the patient presenting with nonspecific pneumonic symptoms like cough (often dry), fever, shortness of breath and occasionally hemoptysis. 2 main differentiating points between PCP and community acquired pneumonia remain the chest X ray findings and an elevated LDH in case of PCP. The chest X ray although normal in mild disease usually yields peri-hilar bilateral middle-lower zone infiltrates in PCP. Bronchoalveolar lavage remains the mainstay diagnostic modality with co-trimoxazole being the first line treatment.

| | | |
|---|---|---|
| PT | 12 seconds | 12-14 seconds |
| APTT | 34 seconds | 30-46 seconds |
| S/Creatinine | 234 micromol/l | 50-120 umol/l |
| S/Urea | 66 mmol/l | 2.5-6.7 mmol/l |
| ALT | 47 iu/l | 5-40 iu/l |
| LDH | 365 iu/l | <300iu/l |
| CXR (PA View) | Bilateral Hilar & Lower Zone Non-Homogenous Opacities | |

What is the most likely diagnosis?

- ○ Aspergillosis
- ○ Community acquired pneumonia
- ○ Pneumocystis jiroveci pneumonia
- ○ Pulmonary tuberculosis
- ○ Sarcoidosis

IV flucloxacillin 17%

IV vacomycin 8%

No further treatment required 23%

Oral doxycycline 2%

Oral flucloxacillin ✔ Correct 50%

answer selected

This patient has developed a line site infection that does not seem severe and is associated with tenderness and redness over the cannula. The cannula needs to be removed and the likely source of infection is S Aureus, Therefore, the use of oral flucloxacillin as first line choice for this uncomplicated infection would be appropriate, which is active against most Staph Aureus, pending cultures.

Further References

A 42-year-old woman presents with a three-week history of progressive fatigue, right upper quadrant discomfort, nausea, and jaundice. Her serum ALT level is 10 times the upper limit of normal. The presence of which of the following in a blood sample is most indicative of acute Hepatitis B virus (HBV) infection?

- Anti-HBc IgA
- Anti-HBc IgG
- Anti-HBc IgM
- Anti-HBs
- HBsAg

Ufone 12:24 AM 76%
studyprn.com

You are asked to see a 72 year old man on the urology ward who has developed a polyarthritis affecting his right knee, ankles, and wrists. He had his 3rd treatment with intravesical BCG chemotherapy for a transitional cell carcinoma of the bladder 5 days earlier.

On examination, his temperature is 38.1°C, he has a warm effusion at his right knee with movement limited to 40 degrees of flexion, he is unable to fully extend His ankles and wrists are tender but not swollen and movement is normal. He has no lymphadenopathy and the rest of his examination is unremarkable.

Investigations reveal:

| | | |
|---|---|---|
| **Hb** | 11.2 g/dl | (13.5-17.7g/dl) |
| **WBC** | 14.1 $x10^9$/l | (4-11 $x10^9$/l) |
| **Neutrophils** | 8.4 $x10^9$/l | (2.0-7.5 $x10^9$/l) |
| **Lymphoctytes** | 5.2 $x10^9$/l | (1.5-4.0 $x10^9$/l) |
| **Platelets** | 440 $x10^9$/l | (150-400 $x10^9$/l) |
| **ESR** | 90 mm/hr | (0-10 mm/hr) |
| **CRP** | 158 mg/dl | (<5 mg/dl) |
| **Creatinine** | 132?mol/l | (79-110?mol/l) |
| **Urea** | 7.5 mmol/l | (2.5-6.7 mmol/l) |
| **ALT** | 26 u/l | (5-40 u/l) |
| **ALP** | 134 u/l | (39-117 u/l) |

Which of the following investigations would you initially request?

- ○ Aspirate joint and send for AFB
- ○ Aspirate joint and send for crystal analysis
- ○ Aspirate joint and send for gram-stain, microscopy and culture
- ○ Chest x-ray
- ○ Mantoux test

Anti-HBc IgM ✔ Correct answer 58%

selected

Anti-HBs 7%

HBsAg 31%

The incubation period of HBV infection ranges from 60 to 180 days. The clinical presentation varies, from asymptomatic infection to cholestatic hepatitis with jaundice and, rarely, liver failure.

In patients with acute infection, HBsAg and markers of active viral replication (HBeAg and HBV DNA) become detectable approximately six weeks after inoculation, before the onset of clinical symptoms. Biochemical abnormalities usually coincide with the prodromal phase of the illness and may persist for several months. Anti-HBc IgM becomes detectable at symptom onset. Detectable levels of anti-HBc IgM may persist for many months, and detectable levels of anti-HBc IgG may persist for many years, if not a lifetime. Anti-HBs is the last serologic marker to become detectable, and it indicates that the infection is resolving. Anti-HBc IgA is not measured.

Aspirate joint and send for AFB 14%

✖ Incorrect answer selected

Aspirate joint and send for crystal analysis 15%

Aspirate joint and send for gram-stain, microscopy and culture 66%

← Correct answer

Chest x-ray 4%

Mantoux test 1%

Treatment by instillation of an attenuated mycobacterium bovis into the bladder is common in superficial transitional cell bladder cancers. Following this a non-infectious polyarthritis may occur in 0.5-1% of patients. Knees are most commonly affected followed by ankles and wrists. Oligo and monoarthritis can also occur. Rarely sacroilitis, dactylitis, conjunctivitis, and uveitis can occur. Joint aspirates do not grow mycobacterium. The exact mechanism is unclear but it is thought that it is a T-cell mediated immune response to repeated antigen stimulation. It tends to occur after several instillations (mean 5). Pyrexia occurs in 2/3 of patients and most will mount raised inflammatory markers. Most are NSAID responsive but if there is no improvement rifampicin and isoniazid treatment may be effective. Infectious arthritis occurs much less frequently. A recent review found 8 cases, 1 had a monoarthritis of the knee; 2 had infection of a joint prosthesis, knee, and hip, respectively; and 5 had discitis. Infection of other organs (lungs, liver, and urinary tract) is more common. Joint infection tends to present and be diagnosed later than non-infectious cases, 8 months vs. 9 days on average. Patients also tend

A 51 year old lady presents with a septic right knee joint. Joint aspiration is sent for culture and Streptococcus bovis is confirmed. She is treated with intravenous antibiotics for 2 weeks and a further 4 weeks of oral antimicrobial therapy.

Which investigation should be carried out next?

- Arthroscopy
- Chest X Ray
- Colonoscopy
- Lumbar spine X rays
- Synovial biopsy

Peer responses

| | |
|---|---|
| Barium swallow | 6% |
| CXR ✖ Incorrect answer selected | 50% |
| ECG | 14% |
| Gastrograffin swallow ← Correct answer | 26% |
| Troponin | 4% |

The likely diagnosis here is iatrogenic oesophageal perforation. Although very rare in diagnostic OGD, it can occur and the fever here suggests that this is unlikely to be cardiac in origin, and as such the most likely test to confirm the diagnosis is a contrast swallow. Gastrografin should be used as it is water soluble and will not cause mediastinitis, unlike barium. Ideally, a plain film swallow should be performed prior to CT as the radiation dose is less.

You are asked to see a 75 year old man who has been treated for congestive heart failure. The nurses are concerned that he has developed site infection of his peripheral venous line. On examination, he has a red and angry looking venflon site in his right forearm. It is tender to touch with a 3 cm area of redness and swelling around the venflon site. He is apyrexial. You remove the catheter and send this for culture.

Which of the following is the most appropriate approach to the management of the patient?

- IV flucloxacillin
- IV vacomycin
- No further treatment required
- Oral doxycycline
- Oral flucloxacillin

| Variables | Responses | Scores |
|---|---|---|
| **Age (in years)** | < 60 | 0 |
| | 60-79 | 1 |
| | >80 | 2 |
| **Shock** | No shock | 0 |
| | Tachycardia (SBP > 100 mmHg, Pulse > 100 beats/minute) | 1 |
| | Hypotension (SBP < 100 mmHg, Pulse > 100 beats/minute) | 2 |
| **Co-morbidity** | None | 0 |
| | Cardiac failure, IHD, any major co-morbidity | 2 |
| | Renal/liver failure, metastatic malignancy | 3 |
| **Diagnosis (post-endoscopy)** | Mallory-Weiss tears | 0 |
| | All other diagnoses | 1 |
| | Malignancy of the upper GI tract | 2 |

Peer responses

| | | |
|---|---|---|
| 0 | | 4% |
| 1 | ✖ Incorrect answer selected | 37% |
| 3 | ← Correct answer | 48% |
| 5 | | 9% |
| 6 | | 2% |

In acute GI haemorrhage, the Rockall score has predictive significance. A simple way of remembering the Rockall Score is ABCDE. ABC gives you the initial score. A = age (below 60 scores 0, 60-79 = 1 and 80 and above =2); B = blood pressure (tachycardia above 100 =1 or BP below 100 = 2); C = co-morbidity (major co-morbidity such as IHD =2, renal/liver disease or Ca =3. Then, the following criteria would be after endoscopic evaluation. D = Diagnosis (Mallory Weiss = 0, all other diagnoses=1, malignancy = 2). E = evidence of haemorrhage – blood adherent clot =1). In our case with age less than 60 (0), pulse above 100 (1) but blood pressure above 100 (0), this patient has an initial Rockall score of 1 suggesting a mortality of 2.4%.

In view of his story and the development of melaena, this suggests a large GI bleed probably a consequence of peptic ulceration related to NSAIDs.

Question ID #3964

A 36-year-old man presents to the emergency department with several hours' history of nausea and severe pain in the abdomen. He describes epigastric pain radiating to his back.

On examination, the patient is in the fetal position and reluctant to move. He is tachycardic and has a low-grade fever.

The admission laboratory tests included:

| | | |
|---|---|---|
| Haemoglobin | 150 | Normal range (130-180 g/l) |
| White cell count | 22.0 | Normal range (4.0-11.0 $x10^9$/L) |
| Bilirubin | 32 | Normal range (<21 umol/L) |
| AST | 130 | Normal range (<40U/L) |
| ALT | 170 | Normal range (<59 U/L) |

In this patient, which of the following laboratory studies is most indicative of severe disease?

- Alkaline phosphatase
- Amylase
- AST level
- Bilirubin
- WBC count

A 78-year-old lady presents to the MAU with atrial fibrillation with a fast ventricular rate. Her medical history includes hypertension, for which she takes Ramipril 2.5mg. You commence her on a Beta-blocker for rate control, and discuss the option of commencing anticoagulant therapy for stroke prevention. She is concerned about the risk of bleeding.

Which of the following scoring systems could you use to help evaluate this patient's risk of major haemorrhage

- CHADS VASC SCORE
- CHADS VASC 2 SCORE
- GLASGOW BLATCHFORD SCORE
- HASBLED SCORE
- ROCKALL SCORE

A 26-year-old woman presents to the MAU with a 4 day history of diarrhoea. She is opening her bowels 8 times a day, passing type 7 stools. There is no blood in the stool. Her symptoms started following a barbeque at a friend's house. She is clinically dehydrated and is resuscitated with intravenous fluids.

After 48 hours her symptoms have settled, but the stool sample sent on admission has cultured Campylobacter spp.

What is the next correct management step?

- ○ Inform public health, as Campylobacter spp is a notifiable disease
- ○ Keep in hospital until stool culture is negative
- ○ Screen other attendees at the barbeque for potential campylobacter infection
- ○ Treat with oral ciprofloxacin
- ○ Treat with oral metronidazole

An elderly man with advanced Alzheimer's Dementia (bed bound, uncommunicative, very limited understanding, doubly incontinent and on a thickened diet) was admitted by ambulance to A&E from his nursing home on account of haematemesis. He had 2 episodes: one in the nursing home and a second witnessed by the paramedics. The volume was estimated to have been about 20ml/episode. His usual medication included aspirin.

On examination, he appeared comfortable, with no apparent epigastric tenderness; his observations were normal (respiratory rate 18, saturations 97% on air, blood pressure 140/90, pulse 88bpm). His pads were wet and there was no melaena on rectal examination.

His bloods returned revealing a haemoglobin 140 g/l (120-160), white cell count 7x109/l (3-10), platelet 200x109/l (200-400), U&E, lactate and coagulation screen were normal.

His condition was discussed with his family and they agreed with the clinician that resuscitation in the event of cardiopulmonary arrest was not in his best interests.

He remained well in the department and his bloods were repeated 6 hours later with a haemoglobin of 13 g/l.

Which of the following would you advocate is the most appropriate plan here aside stopping his aspirin and starting proton pump inhibitors?

- ○ Admit and refer to surgeons for review
- ○ Admit for an inpatient endoscopy
- ○ Admit overnight for observation and repeat FBC tomorrow and manage according to that result
- ○ Discharge and arrange outpatient endoscopy
- ○ Discharge with advice for his GP to review him should there be further concerns

Admit for an inpatient endoscopy 16%

Admit overnight for observation and repeat FBC tomorrow and manage according to that result ✖ Incorrect answer selected 39%

Discharge and arrange outpatient endoscopy 12%

Discharge with advice for his GP to review him should there be further concerns ← Correct answer 32%

As this gentleman has end stage Alzheimer's and his management is primarily about symptom support and tender loving care, further investigation is not required and a palliative management plan should be developed. A cause is apparent in relation to his aspirin therapy and his results do not suggest substantial blood loss based on the normal urea, wet pads (suggesting uncompromised urine output) and a repeat Hb that is reassuring.

Question ID #3962

A 37-year-old man with AIDS whose last CD4 count was 58 presents to the MAU with a four-day history of diarrhoea. He has not been taking his highly active antiretroviral therapy (HAART) medications regularly. The diarrhoea is of large volume, non-bloody, and he has associated nausea, but does not complain of abdominal pain.

What is the most likely cause of the patient's diarrhea?

- Campylobacter species
- Escherichia coli
- Microsporidium
- Salmonella
- Shigella

Campylobacter species 13%

Escherichia coli 6%

Microsporidium ✔ Correct answer selected 79%

Salmonella 1%

Shigella 1%

Microsporidium is one of the most common intestinal infections in patients with AIDS. Intestinal and hepatobiliary disease may be caused by two species: Enterocytozoon bieneusi and Encephalitozoon intestinalis. Typical symptoms are watery, nonbloody diarrhea of mild to moderate severity, but without associated crampy abdominal pain. Weight loss is common. Infection is associated with severe immunodeficiency with CD4 counts less than 100/L

A 36-year-old man is evaluated for treatment of hepatitis C. He has not received interferon-based therapy, but is currently taking a complementary alternative medicine (CAM), the name of which he cannot recall. The patient's blood pressure is 156/92 mm Hg, and he has 1+ bilateral lower extremity edema. Laboratory studies are performed, and later that night, the laboratory calls because the serum potassium level is 2.6 mmol/L (3.5-5). The patient takes no other medication and has no history of hypokalemia. You suspect that the patient is taking which of the following?

- Chinese herbal medicine
- Glycyrriza glabra (licorice)
- Silymarin (milk thistle)
- St John's Wort
- Thymic extract

| | | |
|---|---|---|
| ✔ Glycyrriza glabra (licorice)<br>Correct answer selected | | 66% |
| | Silymarin (milk thistle) | 13% |
| | St John's Wort | 13% |
| ○ | Thymic extract | 2% |

All of these complementary alternative medications have been associated with adverse events. Licorice inhibits 11-ß-hydroxysteroid dehydrogenase, and this may lead to a pseudoaldosterone effect resulting in hypokalemia, sodium retention, and hypertension.

Multiple adverse events have been reported with milk thistle, but the most important relates to its ability to inhibit CYP3A4 and uridine diphospho glucuronosyl transferase. This may lead to interactions with traditional prescription medications such as quinine, lidocaine, certain calcium channel–blocking agents, and cyclosporine, all of which are metabolized in part by CYP3A4.

Chinese herbal medicine has been associated with possible hepatotoxicity, as well as pneumonitis, autoimmune hepatitis, and acute thrombocytopenic purpura.

St John's wort has been shown to cause multiple drug interactions through induction of the cytochrome P450 enzymes CYP3A4 and CYP1A2. This drug-metabolizing enzyme induction results in the increased metabolism of certain drugs, leading to decreased plasma concentration and potential clinical effect

| | |
|---|---|
| Platelets | $158x10^9$/l (140-450) |
| C-Reactive Protein | 135 mg/dl (<5) |
| Glucose | 12.3 mmol/l |
| HbA1c | 7.8% (<6) |

Which of the following would be the most appropriate treatment for this patient?

- IV flucloxacillin
- Oral amoxicillin
- Oral ciprofloxacin
- Oral flucloxacillin
- IV Vancomycin

A 53 year old man is admitted with a 3 day history of left leg pain and fever. He has an 8 year history of type 2 diabetes for which he takes metformin and gliclazide together with ramipril and simvastatin.

On examination his BMI is 32.3 kg/m2, his temperature is 38.5C, pulse 90 bpm and his blood pressure 120/80 mmHg. His left leg is swollen to mid-calf, the skin is red and inflamed with a clear demarcation just below the knee. He has some onycholysis of the left toe nails with some maceration between the toes. His peripheral pulses are all palpable.

Results show:

| | |
|---|---|
| Sodium | 136 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 12.1 mmol/l (3-8) |
| Creatinine | 128 micromol/l (50-100) |
| Haemoglobin | 13.3 g/l (120-160) |
| White cell Count | $12.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |
| C-Reactive Protein | 135 mg/dl (<5) |

IV flucloxacillin ✔ Correct answer selected — 84%

Oral amoxicillin — 2%

Oral ciprofloxacin — 1%

Oral flucloxacillin — 10%

IV Vancomycin — 5%

This patient has a clinical class II to class III cellulitis with systemic upset associated with a comorbidity. The vast majority of cases of cellulitis are due to beta haemolytic strep or S Aureus. Therefore, Flucloxacillin is the treatment of choice in this setting and recommended in guidelines as IV treatment in Class II-III patients. In subjects allergic to beta lactams, clarithromycin/clindamycin can be used.

- Guidance on management of cellulitis in adults

A 46 year old homeless man was admitted in a confused state. The manager of the hostel which he sometimes attended had been worried about him as he had become more confused and complained of headaches over the last 2 weeks and had been vomiting the last 2 days. He was known to abuse alcohol.

On examination, he was confused but had a GCS of 15 and had a temperature of 37.6C. Otherwise, neurological examination was unremarkable.

Relevant investigations:

CT head – mildly enlarged ventricles

Lumbar puncture revealed:

| | |
|---|---|
| Clear fluid | |
| Opening pressure | 30 cm/H20 (10 -20cm H20) |
| Total protein | 2.8 g/l (0.15-0.45) |
| Csf Glucose | 1.8 mmol(>3.3 mmol) |
| White cells | 52 and 100% lymphocytes (<5) |
| Plasma glucose at time of LP | 5.9mmol/l (3.5-5.5) |

Gram stain and AFB stain were both negative

The most likely diagnosis is:

- ○ Cryptococcal meningitis
- ○ Cytomegalovirus meningitis
- ○ Herpes Simplex encephalitis
- ○ Tuberculosis meningitis

# Tuberculosis

See the list below:

- Appearance: Clear or opaque
- Opening pressure: Elevated
- WBC count: 50-500 cells/µL (early PMN then lymph)
- Glucose level: Low
- Protein level: Elevated

Consider additional tests: CSF Gram stain and cultures, blood cultures, CSF bacterial antigens, CSF PCR, CSF tuberculosis culture/stain, others depending on clinical findings

Cryptococcal meningitis ✖ 31%

Incorrect answer selected

Cytomegalovirus meningitis 2%

Herpes Simplex encephalitis 24%

Tuberculosis meningitis ← 42%

Correct answer

This is Tuberculosis meningitis and empirical treatment is needed early here. Being homeless and heavy alcohol consumption are risk factors. The negative stains do not rule out TB meningitis and have a sensitivity of only 60%. TB meningitis classically has a raised opening pressure, lymphocytosis, raised protein and a very low glucose.

Bacterial meningitis would expect more neutrophils, viral meningitis typically has >60% serum glucose.

You are called to see an 82 year old man on the ward who has developed offensive, watery diarrhoea. The man was admitted with chest infection and treated appropriately and, whilst awaiting home assessment and institution of a package of care, has developed diarrhoea associated with some abdominal pain.

He seems comfortable, his temperature is 37.3C, pulse 88 bpm and blood pressure 128/80 mmHg. He has some abdominal tenderness and some increased bowel sounds. His abdominal X-ray is normal and his blood results are normal with a CRP of 12 mg/dl (<5). faecal specimens have been sent and the patient is isolated.

Which of the following is the most appropriate approach to treating this patient?

- ○ No treatment currently required. Await cultures
- ○ Oral co-trimoxazole
- ○ Oral immodium
- ○ Oral metronidazole
- ○ Oral vancomycin

| Ranson (alcoholic or other) | Ranson (biliary) |
|---|---|
| **At admission** | **At admission** |
| Age >55 y | Age >70 y |
| GB > 16 000/$mm^3$ | GB > 18 000/$mm^3$ |
| LDH > 350 U/l | LDH > 250 U/l |
| AST > 250 U/l | AST > 250 U/l |
| Glycemia >200 mg/dl | Glycemia >220 mg/dl |
| **In 48 h** | **In 48 h** |
| Drop in hematocrit > 10% | Drop in hematocrit > 10% |
| BUN increase >5 mg/dl | BUN increase >2 mg/dl |
| Calcium <8 mg/dl | Calcium <8 mg/dl |
| $PO^2$ <60 mmHg | $PO^2$ <60 mmHg |
| Bases deficit >4 mEq/l | Bases deficit >5 mEq/l |
| Fluid loss >6L | Fluid loss >4L |
| Each item worth 1 point (0 a 11 points) | |

| | | |
|---|---|---|
| Oral metronidazole ✔ answer selected | Correct | 62% |
| Oral vancomycin | | 11% |

This patient is symptomatic with profuse watery diarrhoea, likely from the history to be due to C. Difficile infection. The patient should be treated with oral metronidazole as 1 st line therapy. In more severe cases complicated by systemic illness, oral vancomycin can be used. It is important to remember that supportive care should always be given, including attention to hydration, electrolytes and nutrition. Antiperistaltic agents should be avoided in acute infection due to risk of toxic megacolon. Metronidazole (or vancomycin, if appropriate) can be commenced if patient has diarrhoea AND one of the following: Positive C. difficile toxin test OR Results of C. difficile toxin test pending AND clinical suspicion of C.diff. That means treatment can be commenced if there is strong clinical suspicion while stool results are awaited.

| Rockall Scoring System | | | | |
|---|---|---|---|---|
| **Variable** | **Score=0** | **Score =1** | **Score =2** | **Score =3** |
| **Age (years)** | <60 | 60-79 | >80 | |
| **Comorbidity** | | | Congestive heart failure, ischemic heart disease | Renal failure, liver disease, metastatic disease |
| **Shock** | No shock | Pulse > 100 bpm | Systolic BP <100 mmHg | |
| **Source of bleeding** | Mallory-Weiss Tear | All other diagnoses: e.g., esophagitis, gastritis, peptic ulcer disease, varices | Malignancy | |
| **Stigmata of recent bleeding** | None | | Adherent clot or spurting vessel | |

A 78 year old lady with rheumatoid arthritis and type 2 diabetes mellitus presents with a chesty productive cough. Her medications include Metformin 1g bd, Methotrexate 15mg weekly, Folic acid 5 mg daily, and Prednisolone 5mg od. She is treated at home for a chest infection with a one week course of amoxycillin and makes a good recovery. Six weeks later she presents with severe lower lumbar back pain and is noted to have a temperature of 37C, a pulse of 100 bpm and a blood pressure of 138/78 mmHg. She is noted to have a left foot drop and a rash over the left shin which is waxy brown-yellow in colour.

Her investigations reveal:

| | | |
|---|---|---|
| **Haemoglobin** | 12.9 g/dL | (13 - 18 g/dL) |
| **WBC** | 15.3 $x10^9$/L | (4 -11 $x10^9$/L) |
| **Neutrophils** | 12.1 x $10^9$/L | (2 - 8 $x10^9$/L) |
| **Platelets** | 514 $x10^9$/L | (150 - 400 $x10^9$/L) |
| **CRP** | 53 mg/L | (< 10 mg/L) |
| **ESR** | 74 mm/hr | (< 40 mm/hr) |

A 62 year old man is admitted to MAU by his GP with a 5 day history of productive cough and feeling unwell. He has no other medical history of note. His cough is productive of a greenish sputum and he has become increasingly breathless. He is an ex-smoker, having stopped 10 years ago. He takes no medication.

On examination, he appears unwell, has a BMI of 28.5 kg/m2, a pulse of 90 bpm regular, a blood pressure of 124/68 mmHg and oxygen saturations on air of 94%. His temperature is 38.8C and his respiratory rate is 30. Auscultation of the heart is normal and examination of the chest reveals some crackles at the right base.

His results reveal:

| | |
|---|---|
| Sodium | 136 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 8.6 mmol/l (3-8) |
| Creatinine | 110 micromol/l (50-100) |
| Haemoglobin | 13.5 g/l (120-160) |
| White cell Count | $14.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |
| C-Reactive Protein | 128 mg/dl (<5) |

The chest x-ray reveals haziness at the right base.

Which of the following is the most appropriate treatment for this patient?

- IV amoxicillin plus IV clarithromycin
- IV ciprofloxacin
- IV levofloxacin
- Oral amoxicillin plus clarithromycin
- Oral co-trimoxazole

| | | |
|---|---|---|
| **Ig M** | 2.4 g/L | (0.4 -2.3 g/L) |
| **Ig A** | 7.8 g/L | (0.6 -5.0 g/L) |
| **Ig G** | 12.1 g/L | (6.0 - 15.6 g/L) |

Serum Electrophoresis - increased alpha and beta globulins, no paraprotein detected.
Urine electrophoresis - Bence jones protein not detected

Lumbar spine X ray - Mild degenerative lumbar spondylotic changes.
Chest X Ray - Clear lung fields.

Which of the following is the most likely diagnosis?

- Infective discitis
- Lumbar spondylosis
- Multiple myeloma
- Osteoporotic fracture
- Rheumatoid vasculitis

An 18 year old male of Asian origin was admitted feeling unwell with a headache that had developed over the last 24 hours. He was otherwise fit and well. His only recent travel history was a visit to Pakistan 2 months ago.

On examination, he had a temperature of 38.8C, some mild neck stiffness and mild photophobia. His pulse was 88 bpm, blood pressure 118/80 mmHg. No obvious rash was present and there were no abnormal neurology.

Results reveal:

| | |
|---|---|
| FBC | Normal |
| U+Es | Normal |
| CRP | 15 mg/dl (<5) |

CT head was reported as normal and the patient then went on to have a lumbar puncture, the results of which reveal:

| | |
|---|---|
| Appearance | Clear |
| Protein | 0.42 mg/l (<0.4) |
| Glucose | 4.2 mmol/l (>3.3) |
| White cells | 83/ul (0-5) |
| Red cells | 20 / ul (0-5) |

Which of the following is the most likely diagnosis?

- ○ Aseptic meningitis
- ○ Bacterial meningitis
- ○ Migraine
- ○ Subarachnoid haemorrhage
- ○ Tuberculous meningitis

| | | |
|---|---|---|
| Aseptic meningitis ✔ Correct answer selected | | 44% |
| Bacterial meningitis | | 15% |
| Migraine | | 0% |
| Subarachnoid haemorrhage | | 6% |
| Tuberculous meningitis | | 35% |

This patient is likely to have aseptic meningitis from the description in the history and the LP findings. The slight elevation of the WCC and protein would be in keeping with this diagnosis. We are not given any history regarding the microbiological assessment or gram staining of the CSF as is often the case. The patient should be treated with analgesia and can be discharged. The correct interpretation of the CSF is important in acute medicine and will be a focus in exams.

**Reference:**

- Interpreting the CSF results.

A 27 year old man is referred urgently by his general practitioner with right shoulder pain. He is on no medication but admits to using intravenous heroin on a regular basis. On examination, he is pyrexial ($38.1^0$C) and examination of the anterior chest wall reveals tenderness and swelling over the right sternoclavicular joint. He has no other joint abnormalities.

An ultrasound is performed which reveals a fluid collection around the sternoclavicular joint. This is aspirated and 2mls of turbid fluid is sent for analysis. He is commenced on broad spectrum antibiotics intravenously. The culture is positive 24 hours later.

Given his history which of the following is the most likely cause of his septic arthritis?

- Haemophilus influenzae
- Polymicrobial infection
- Pseudomonas aeruginosa
- Staphyloccocus aureus
- Streptococcus pneumoniae

A 20 year old female is admitted with nausea and vomiting which commenced after she ate a pizza approximately 4 hours earlier. She felt nauseous had some associated abdominal pain and developed profuse vomiting. She has been unable to keep anything down and has become weaker. She is 29 weeks pregnant with her second child and the pregnancy is doing well. Observations are generally fine, she seems slightly dehydrated yet investigations are normal. She is treated with an IV infusion of normal saline but is distressed by the vomiting.

Which of the following would be the most appropriate approach to managing the nausea and vomiting?

- Continue IV fluids only and no anti-emetics
- IV Dexamethasone
- IV Metoclopramide
- IV Ondansetron
- IV Prochlorperazine

A 73 year old man is admitted to MAU by the GP with a 5 day history of cough and feeling unwell. He has otherwise been well with no other history of note. His cough is productive of a greenish sputum and he has become increasingly breathless. He is a non-smoker.

On examination, he has a BMI of 28.5 kg/m2, a pulse of 82 bpm regular, a blood pressure of 122/88 mmHg and oxygen saturations on air of 95%. His temperature is 38.5C and he has a respiratory rate of 26/min. Auscultation of the heart is normal and examination of the chest reveals some crackles at the right base.

His results reveal:

| | |
|---|---|
| Sodium | 136 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 6.8 mmol/l (3-8) |
| Creatinine | 98 micromol/l (50-100) |
| Haemoglobin | 13.3 g/l (120-160) |
| White cell Count | $12.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |
| C-Reactive Protein | 55 mg/dl (<5) |

The chest x-ray reveals haziness at the right base.

Which of the following is the most appropriate approach to the management of this patient?

- ○ Admit to hospital and treat with IV amoxicillin
- ○ Admit to hospital and treat with IV amoxicillin and oral clarithromycin
- ○ Admit to hospital and treat with oral amoxicillin 500 mg tds
- ○ Discharge home and advise paracetamol
- ○ Discharge home with oral amoxicillin

Admit to hospital and treat with oral amoxicillin 500 mg tds — 16%

Discharge home and advise paracetamol — 0%

Discharge home with oral amoxicillin ✔ Correct answer selected — 66%

This patient has a community acquired pneumonia. The important calculation here is the CURB-65 score which has prognostic significance. His CURB65 score is 1 and is calculated as follows:

| | |
|---|---|
| Confusion | 0 |
| Urea >7 | 0 |
| Respiratory rate >30 | 0 |
| BP Systolic <90, Diastolic <60 | 0 |
| 65 years or above | 1 |

Under these circumstances, the guidance with a CURB-65 of 0-1 suggests that the patient can be managed at home with oral amoxicillin.

| | | |
|---|---|---|
| ○ | Haemophilus influenzae | 1% |
| ○ | Polymicrobial infection | 2% |
| ○ | Pseudomonas aeruginosa | 5% |
| ◉ | Staphyloccocus aureus ✔ | 91% |
| | Correct answer selected | |
| ○ | Streptococcus pneumoniae | 2% |

Infection of the sternoclavicular joint is rare but represents 17% of joint infections in IV drug users versus 1% in the general population. Pseudomonas aeruginosa joint infection is considered to be more common in IV drug users but Staphylococcus aureus infection still remains the most common infective agent based on a recent review of 180 cases[1]. Despite this it may be important to cover both staphylococcal and pseudomonas infection until culture results are available in this patient.

IV cefotaxime 2%

IV clarithromycin 3%

Oral amoxicillin 20%

Oral doxycycline ← Correct 39%

answer

Oral levofloxacin ✖ Incorrect 35%

answer selected

This patient has a community acquired pneumonia but is allergic to penicillin and therefore, according to guidance, could be treated with oral non-penicillin alternatives such as doxycycline or clarithromycin.

**Reference**

- BTS Guidance on CAP

Admit to hospital and treat with oral amoxicillin 500 mg tds — 16%

Discharge home and advise paracetamol — 0%

Discharge home with oral amoxicillin ✔ Correct answer selected — 66%

This patient has a community acquired pneumonia. The important calculation here is the CURB-65 score which has prognostic significance. His CURB65 score is 1 and is calculated as follows:

| | |
|---|---|
| Confusion | 0 |
| Urea >7 | 0 |
| Respiratory rate >30 | 0 |
| BP Systolic <90, Diastolic <60 | 0 |
| 65 years or above | 1 |

Under these circumstances, the guidance with a CURB-65 of 0-1 suggests that the patient can be managed at home with oral amoxicillin.

| | | |
|---|---|---|
| ○ | Continue IV fluids only and no anti-emetics | 12% |
| ○ | IV Dexamethasone | 5% |
| ○ | IV Metoclopramide ✔ Correct answer selected | 36% |
| ○ | IV Ondansetron | 24% |
| ○ | IV Prochlorperazine | 22% |

This young woman, who is in her second pregnancy, is likely to have acquired S Aureus food poisoning and is particularly symptomatic as a consequence. The most appropriate approach is to prescribe an antiemetic, and the drug with greatest safety data associated with its use in pregnancy is metoclopramide. Other recommended agents include antihistamines such as cyclizine.

A 73 year old man is admitted to the MAU by his GP with a 5 day history of cough and feeling unwell. He has otherwise been well with no other history of note. His cough is productive of a greenish sputum and he has become increasingly breathless. He is a non-smoker. He informs you that he has a penicillin allergy. Otherwise he does not take any medication.

On examination, he has a BMI of 28.5 kg/m2, a pulse of 82 bpm regular, a blood pressure of 122/88 mmHg and oxygen saturations on air of 95%. His temperature is 38.5C. Auscultation of the heart is normal and examination of the chest reveals some crackles at the right base.

His results reveal:

| | |
|---|---|
| Sodium | 136 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 6.8 mmol/l (3-8) |
| Creatinine | 98 micromol/l (50-100) |
| Haemoglobin | 13.3 g/l (120-160) |
| White cell Count | $12.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |
| C-Reactive Protein | 55 mg/dl (<5) |

The chest x-ray reveals some haziness at the right base.

Which of the following is the most appropriate treatment for this patient?

- IV cefotaxime
- IV clarithromycin
- Oral amoxicillin
- Oral doxycycline
- Oral levofloxacin

# Subarachnoid hemorrhage

See the list below:

- Appearance: Xanthochromia, bloody, or clear

- Opening pressure: Elevated

- WBC count: (1 additional WBC per 1000 RBCs is considered normal correction)

- Glucose level: Normal

- Protein level: Elevated

Consider additional tests: CSF Gram stain and cultures, others depending on clinical findings

## Aseptic (viral) meningitis

See the list below:

- Appearance: Clear
- Opening pressure: Normal or elevated
- WBC count: 10-1000 cells/µL (lymph but PMN early)
- Glucose level: >60% serum glucose (may be low in HSV infection)
- Protein level: Elevated (>50 mg/dL)

Consider additional tests: CSF Gram stain and cultures, blood cultures, CSF bacterial antigens, CSF PCR (eg, herpes simplex virus [HSV], varicella-zoster virus [VZV]), others depending on clinical findings

| | | | |
|---|---|---|---|
| | Infective discitis ✔ Correct<br>answer selected | | 55% |
| ○ | Lumbar spondylosis | | 1% |
| ○ | Multiple myeloma | | 3% |
| ○ | Osteoporotic fracture | | 2% |
| | Rheumatoid vasculitis | | 39% |

This lady has risk factors for infection - Type 2 Diabetes Mellitus and immunosuppression with methotrexate for rheumatoid arthritis. Probable haematogenous spread of infection after the recent chest infection, seems the most probable cause of the presentation, resulting in seeding of the infection at the lumbar intervertebral disc. She has nerve root signs at L4/5 with weak tibialis anterior affecting ankle dorsiflexion. Incidentally, the rash is the description of necrobiosis lipoidica diabeticorum, and not erythema nodosum or a vasculitis rash. Less than 50% of infective discitis patients have fever. Urgent MRI imaging is first choice here. CT guided biopsy can help to identify an organism if blood cultures remain negative, but only in 50% of cases. Staph. aureus and coagulase negative Staphylococci are the most common organisms. Tuberculosis should always be considered on the list of differential diagnoses in the immunosuppressed patient. The waxy-brown rash on the shin is a red herring and in this patient with diabetes suggests necrobiosis lipoidica diabeticorum.

IV amoxicillin plus IV clarithromycin ✖ Incorrect answer selected — 52%

IV ciprofloxacin — 0%

IV levofloxacin — 1%

Oral amoxicillin plus clarithromycin ← Correct answer — 46%

Oral co-trimoxazole — 1%

This man has a CURB-65 score of 2, suggesting moderately severe pneumonia, and requires admission and treatment with oral amoxicillin plus clarithromycin. IV treatment with benzylpenicillin/amoxicillin plus clarithromycin can be used in subjects who are unable to take oral treatment. There is no indication here that the patient is unable to take oral medication.

Ufone 10:24 AM 31%
studyprn.com

A 56 year old gentleman known to have adult polycystic kidney disease presents to Accident and Emergency with complaints of pain in the left flank, fever, pyuria and dysuria. He regularly takes lisinopril 5 mg to control his hypertension.

On examination, he remains febrile with a temperature of 39 degree celsius, a pulse rate of 100/minute and a blood pressure controlled at 120/80 mmHg. He has tenderness over his left flank with both kidneys manually palpable. He has no other visceromegaly and has normal bowel sounds. You suspect a urine infection and get the following test results:

| | | |
|---|---|---|
| Hb | 13.4 g/dl | 13-18 g/dl |
| WBC | 14.7 x $10^9$/l | 4-11 x $10^9$/l |
| Platelets | 316 x $10^9$/ | 150-300 x $10^{9/l}$ |
| PT | 12 seconds | 12-14 seconds |
| APTT | 34 seconds | 30-46 seconds |
| Serum Creatinine | 89 mmol/l | 50-120 umol/l |

Ufone 10:24 AM 31%
studyprn.com

| | | |
|---|---|---|
| Serum Creatinine | 89 mmol/l | 50-120 umol/l |
| S/Urea | 7 mmol/l | 2.5-6.7 mmol/l |
| CRP | 45 mg/l | <5 mg/l |

Urine Analysis:

| | |
|---|---|
| Pus Cells | Numerous |
| Leucocyte Esterase | +++ |
| Blood | ++ |

Which of the group of antibiotics can be started empirically by virtue of excellent cyst penetration?

- Amoxicillin & metronidazole
- Chloramphenicol & cefuroxime
- Ciprofloxacin & co-trimoxazole
- Gentamycin & cefixime
- Vancomycin & linezolid

empirically by virtue of excellent cyst penetration?

Peer responses

- Amoxicillin & metronidazole — 4%
- Chloramphenicol & cefuroxime — 5%
- Ciprofloxacin & co-trimoxazole — 48%
  ✔ Correct answer selected
- Gentamycin & cefixime — 37%
- Vancomycin & linezolid — 5%

Fluoroquinolones and cotrimoxazole are known to cross the cyst membranes. They cover the most commonly encountered bacteria in such scenarios i.e. E.coli, proteus, klebsiella and other enterobacteriaceae species. Cyst aspiration to culture the organism remains gold standard.

Admit and commence IV clarithromycin ✔ Correct answer selected — 51%

Admit and commence IV co-trimoxazole — 14%

Admit and commence IV flucloxacillin — 26%

Discharge on oral doxycycline — 9%

Discharge on oral flucloxacillin — 0%

There are 2 considerations here. Firstly the question of whether to admit or not. The Eron class would suggest that the patient needs to be admitted; she is systemically unwell with tachycardia and pyrexia, and is also diabetic, so she would be classified as Eron class 3. Now it comes down to which treatment to select. This patient is penicillin allergic so a beta lactam should not be used. The alternatives recommended for penicillin allergic patients are either IV clarithromycin or IV clindamycin.

Arrange urgent ITU admission 36%

Immediate IV amoxicillin/clarithromycin ✔ Correct 63%

answer selected

Immediate dose oral cotrimoxazole 0%

IV bolus bicarbonate 0%

IV bolus hydrocortisone 1%

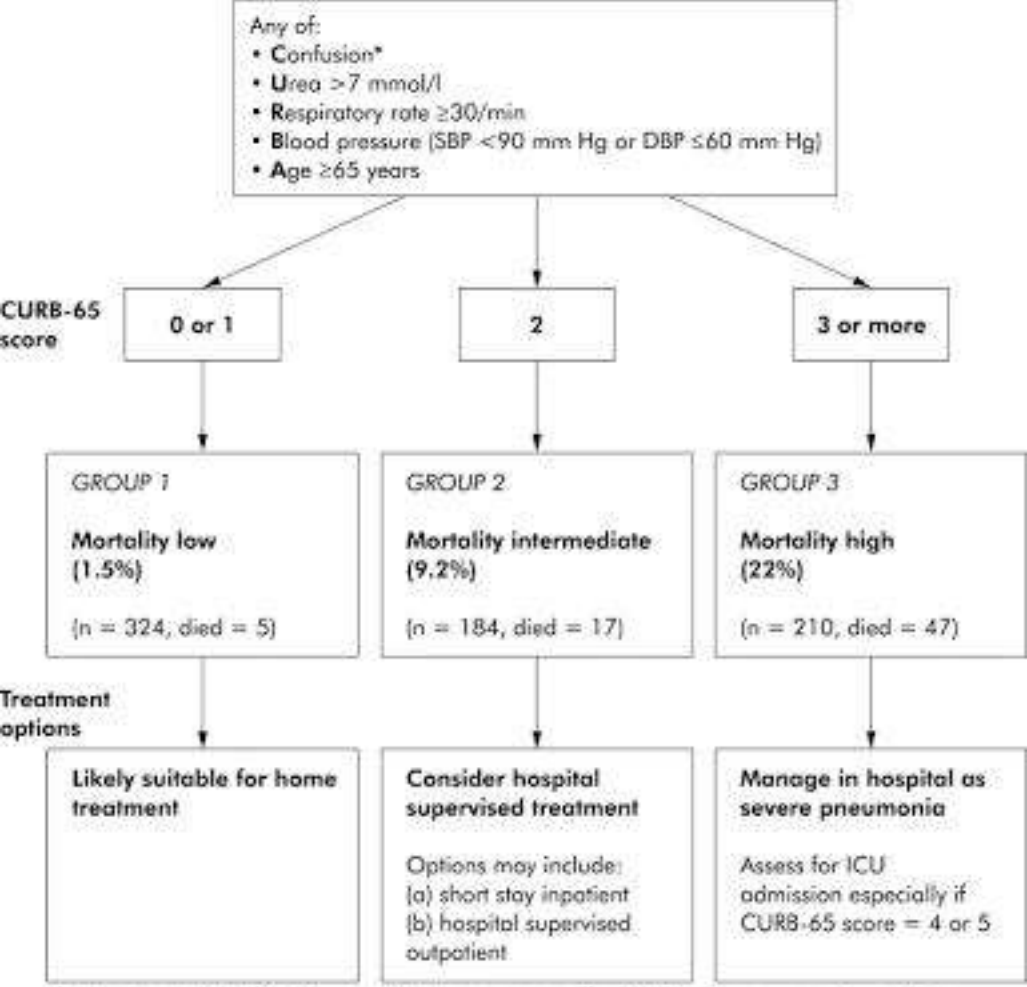
## Explanation

NICE guidelines recommend that all patients aged 12 years and over who have suspected sepsis and 1 or more high risk criteria should receive an immediate senior review and a broad-spectrum antimicrobial at the maximum recommended dose without delay (within 1 hour of identifying that they meet any high risk criteria in an acute hospital setting)'.

A 30-year-old woman with no past medical history was admitted with fever, breathlessness and a productive cough. She was not taking any regular medication and was not pregnant.

At presentation she had a blood pressure of 80/50 mmHg and was given 2 litres of rapid intravenous saline. Her vital signs were recorded again and were as follows:

| Test | Result | Normal ranges |
|---|---|---|
| Temperature | 38°C | 36.1°-37.2°C |
| Respiratory rate | 26 breaths/min | 16–20 breaths/min |
| Heart rate | 110 bpm | 50–80 bpm |
| Blood pressure | 80/50 mmHg | 120/80 mmHg |
| Oxygen saturations on air | 92% | 95 to 100% |
| Venous blood gas lactate | 5 mmol/l | (0.5-1 mmol/l) |


Any of:
• Confusion*
• Urea >7 mmol/l
• Respiratory rate ≥30/min
• Blood pressure (SBP <90 mm Hg or DBP ≤60 mm Hg)
• Age ≥65 years
CURB-65 score
0 or 1
2
3 or more
GROUP 1
Mortality low (1.5%)
(n = 324, died = 5)
GROUP 2
Mortality intermediate (9.2%)
(n = 184, died = 17)
GROUP 3
Mortality high (22%)
(n = 210, died = 47)
Treatment options
Likely suitable for home treatment
Consider hospital supervised treatment
Options may include:
(a) short stay inpatient
(b) hospital supervised outpatient
Manage in hospital as severe pneumonia
Assess for ICU admission especially if CURB-65 score = 4 or 5

*defined as a Mental Test Score of 8 or less, or new disorientation in person, place or time

Question ID #3576

A 62 year old man is admitted to MAU by his GP with a 5 day history of productive cough and feeling unwell. He has no other medical history of note. His cough is productive of a greenish sputum and he has become increasingly breathless. He is an ex-smoker having stopped 10 years ago. He takes no medication.

On examination, he appears unwell, has a BMI of 28.5 kg/m2, a pulse of 90 bpm regular, a blood pressure of 124/68 mmHg and oxygen saturations on air of 94%. His temperature is 38.8C and his respiratory rate is 30. Auscultation of the heart is normal and examination of the chest reveals some crackles at the right base.

His results reveal:

| | |
|---|---|
| Sodium | 136 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 8.6 mmol/l (3-8) |
| Creatinine | 110 micromol/l (50-100) |
| Haemoglobin | 13.5 g/l (120-160) |
| White cell Count | $14.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |
| C-Reactive Protein | 128 mg/dl (<5) |

The chest x-ray reveals haziness at the right base.

What is the CURB-65 score in this patient?

- 0
- 1
- 2
- 3
- 4

| | | |
|---|---|---|
| Venous blood gas lactate | 5 mmol/l | (0.5-1 mmol/l) |

She is also confused. According to NICE guidelines, what should happen next?

- Arrange urgent ITU admission
- Immediate IV amoxicillin/clarithromycin
- Immediate dose oral cotrimoxazole
- IV bolus bicarbonate
- IV bolus hydrocortisone

A 78 year old man with a history of Parkinson's disease presents after his relatives became concerned as he had become increasingly confused, and had been shaking uncontrollably at times.

On examination the patient was drowsy, with increased rigidity in the limbs; pupils were normal. He had a noticeable tremor. Examination of the chest showed a right basal pneumonia, and the chest x-ray confirmed a right basal pneumonia.

Of significance in the investigations, Urea was 17.5 mmol/l (3-8), Creatinine 189 micromol/l (50-100), CRP was 120 mg/l (<5) and his Creatinine Kinase was 12626 iu/l (50-200).

You read from his letters on portal that bloods taken in the Parkinson's disease clinic 6 days previously had been in normal range. His Levodopa dose had been increased due to increased rigidity from sinemet 25/100 one tablet tds to 50/100 morning and evening and 25/100 midday.

With regards to his movement disorder, which treatment is the most appropriate?

- ○ Add catechol-O-methyltransferase inhibitor (entacapone) and increase Levodopa
- ○ Add sodium valproate
- ○ Decrease dose of levodopa
- ○ Increase dose of levodopa (sinemet)
- ○ Use i.v lorazepam

| | |
|---|---|
| 0 | 0% |
| 1 | 5% |
| 2 ✔ Correct answer selected | 90% |
| 3 | 4% |
| 4 | 0% |

The CURB-65 score is a score used in community acquired pneumonia with prognostic value. His CURB65 score can be calculated as follows:

| | |
|---|---|
| Confusion | 0 |
| Urea >7 | 1 |
| Respiratory rate >30 | 1 |
| BP Systolic <90, Diastolic <60 | 0 |
| 65 years of age or above | 0 |

A 57-year-old woman is admitted with fever, malaise and soreness of the left leg. The foreleg has become increasingly red and painful over the last 24 hours. She is a type 2 diabetic and is well controlled on metformin and sitagliptin. She also takes ramipril and simvastatin. She describes being penicillin allergic, having had a rash when she had ampicillin in her youth. On examination she has a temperature of 38.9C, a pulse of 110 bpm and a blood pressure of 118/60 mmHg. She has an erythematous swelling of the left leg extending from the foot to the knee. Blood results reveal:

| Test | Result | Normal range |
|---|---|---|
| White cell count | 12.1x109/l | 3-10 |
| CRP | 180 mg/l | <5 |
| U+Es | Normal | |
| Glucose | 15.5 mmol/l | |

Which of the following is the most appropriate treatment for this patient?

- ○ Admit and commence IV clarithromycin
- ○ Admit and commence IV co-trimoxazole
- ○ Admit and commence IV flucloxacillin
- ○ Discharge on oral doxycycline
- ○ Discharge on oral flucloxacillin

An 80 year old woman is admitted following an hour history of weakness and loss of speech affecting the left side of the body. By the time she is admitted the weakness has resolved and her speech is improving.

She has a history of hypertension for which she takes amlodipine 10mg daily. She also takes atorvastatin 10mg daily. Otherwise she is well with no other history of note.

On examination, her blood pressure is 144/80 mmHg and her pulse is 68 bpm regular.

Which of the following most accurately suggests the approximate risk of this patient having a stroke within the next week?

- <1%
- 5%
- 10%
- 25%
- 40%

Add sodium valproate 0%

Decrease dose of levodopa ✔ 45%

Correct answer selected

Increase dose of levodopa (sinemet) 5%

Use i.v lorazepam 13%

The patient has features consistent with an acute hyperkinetic disorder. This is likely precipitated by increased Levodopa dose, and potentiated by community acquired pneumonia.

Acute hyperkinetic disorders can present as chorea, dystonia, choreoathetosis, and myoclonus. Often, the condition can be misdiagnosed as a seizure or severe tremor. Levodopa dosage should be adjusted gradually and the patient closely monitored for the effects of subtherapeutic therapy.

Continued dyskinetic movements can cause exhaustion, dehydration, trauma and rhabdomyolysis.

Ufone 11:33 AM 15%
AA studyprn.com
StudyPRN

The important issue here is to calculate this patient's ABCD2 score. The ABCD2 score is a risk assessment tool designed to stratify TIAs according to future risk of stroke.

A refers to age >60 =1

B refers to blood pressure with either systolic or diastolic >140/90 = 1

C – Clinical Features: Unilateral weakness with or without speech impairment =2. Speech impairment =1

D – Duration: 10-59mins =1. >60 mins = 2

2 – Type 2 diabetes = 1

In this case the patient scores 6 based on age, clinical features and duration. This suggests quite a high risk of future stroke of about 12% at 7 days, with guidance suggesting the patient be admitted, investigated and treated.

2 Minute Medicine® **ABCD2 Score** 2minutemedicine.com

| Risk Factor | Points |
|---|---|
| **A**ge ≥60 years | 1 |
| **B**lood pressure elevation (systolic >140 mmHg and/or diastolic ≥90 mmHg) | 1 |
| *Clinical features* | |
| Unilateral weakness | 2 |
| Speech disturbance without weakness | 1 |
| *Duration of symptoms* | |
| ≥60 minutes | 2 |
| 10-59 minutes | 1 |
| **D**iabetes mellitus | 1 |

| ABCD2 Score | Patients | 2-day risk (%) | 7-day risk (%) | 90-day risk (%) |
|---|---|---|---|---|
| Low (0-3) | 1,628 | 1.0 | 1.2 | 3.1 |
| Moderate (4-5) | 2,169 | 4.1 | 5.9 | 9.8 |
| High (6-7) | 1,012 | 8.1 | 11.7 | 17.8 |

Table 1. The ABDC2 Score. | 2minutemedicine.com

Ufone 11:36 AM 14%
studyprn.com

An 83 year old lady is admitted from home as she has been more breathless of late. She lives alone and usually manages well. She was seen by her daughter who felt she was more breathless than usual as she has a background of COPD associated with smoking. The GP decided to admit her. She used inhalers and took zopiclone at night to help her sleep. Other than some mild memory problems she had little else of note in her history. She did not drink any alcohol but smoked about 5 cigarettes daily.

On examination she seemed fine, her temperature was 37C, pulse 80 bpm reg and blood pressure 110/80 mmHg. Her oxygen saturations were 94% on air. Other than occasional wheeze there was nothing else of note on examination. Full blood count, U+Es were normal and her CRP was 15 mg/l (<5). She was given oral antibiotics by the night team and was to be reviewed by the consultant the following morning.

The following morning she was agitated, aggressive and would not let anyone perform any observations. She would lock herself in the toilet and felt that people were intent on harming her. She was walking around the unit quite unperturbed and did not otherwise seem distressed but would not permit any medical staff to go near her nor would she listen to what they were saying.

Which of the following is the most appropriate approach to the management of this patient?

- ○ Give chlorpromazine IV/IM
- ○ Give diazepam IV/IM
- ○ Give haloperidol IV/IM
- ○ Give lorazepam IV/IM
- ○ Move to a side room on a ward and just observe

The important issue here is to calculate this patient's ABCD2 score. The ABCD2 score is a risk assessment tool designed to stratify TIAs according to future risk of stroke.

A refers to age >60 =1

B refers to blood pressure with either systolic or diastolic >140/90 = 1

C – Clinical Features: Unilateral weakness with or without speech impairment =2. Speech impairment =1

D – Duration: 10-59mins =1. >60 mins = 2

2 – Type 2 diabetes = 1

In this case the patient scores 6 based on age, clinical features and duration. This suggests quite a high risk of future stroke of about 12% at 7 days, with guidance suggesting the patient be admitted, investigated and treated.

Give haloperidol IV/IM ✔ 56%

Correct answer selected

Give lorazepam IV/IM 10%

Move to a side room on a ward and just observe 31%

This patient is acutely agitated, is likely to have mild dementia and may be delirious. It is therefore, important to assess the patient properly and for their own safety as well as staff safety, the patient should receive sedation. The most appropriate is a typical antipsychotic such as haloperidol. Benzodiazepines are not recommended in the elderly other than for delirium tremens as they are more respiratory sedatory.

Sedation would then enable this patient to be evaluated appropriately for delirium or any other cause of her agitation. In this case, the mild dementia, change of environment, possible use/dependence on zopiclone as well as infection may all contribute.

| | | |
|---|---|---|
| | Haloperidol | 18% |
| | Lorazepam | 19% |
| | Pramiprexole | 17% |
| selected | Rivastigmine ✔ Correct answer | 41% |
| | Trazadone | 5% |

The patient has features of Parkinsonism with a worsening mobility, frequent falls, fluctuating levels of lucidity and hallucinations suggesting a diagnosis of Lewy Body Dementia.

Anticholinergic medication and typical antipsychotics medication are contraindicated in Lewy Body Dementia. Anticholinergic medication increases the mortality when used in Lewy Body Disease three times above average.

A 68 year old man is admitted on the acute medical take, via the GP, following repeated episodes of falling. He was living at home with a four times a day package of care, and family assistance, but had become increasingly dependent on his family as his mobility had significantly deteriorated over the past 6 months.

On admission the patient is complaining of hallucinations and is concerned that the nursing staff are "out to get him". He is not aggressive but his family states that these hallucinations have been worsening and at times he can be very disorientated and confused.

Physical examination is unremarkable apart from some minor cogwheeling rigidity in his hands, and a shuffling gait with reduced arm swing. He showed evidence of mild cognitive deficit on testing, and was unable to draw a clock.

Bloods were in the normal range, ECG showed normal sinus Rhythm and CT head showed mild small vessel disease.

He is finding the hallucinations to be distressing. What is the most appropriate treatment for this?

- ○ Haloperidol
- ○ Lorazepam
- ○ Pramiprexole
- ○ Rivastigmine
- ○ Trazadone

A 70 year old woman presents to A&E with severe sudden onset vertigo. This episode developed over the period of an hour and now she is unable to stand and feels nauseous. She is uncomplaining of recent illness, nor tinnitus or hearing loss. She has had no similar episodes previously.

Neurological examination is unremarkable other than a horizontal beat nystagmus to the right. Her gait is normal although unsteady.

She has a history of hypertension and had previous cardioversion for atrial fibrillation 15 years ago following an episode of pneumonia. She is currently taking Ramipril for hypertension, with her blood pressure being 124/79 mmHg, and she is in sinus rhythm.

A CT head is reported as unremarkable.

She is adamant she needs to return home as soon as possible as she is carer for her brother who has advanced Parkinson's disease.

What is the next appropriate treatment?

- ○ Cinnarizine 30mg OD.
- ○ Lorazepam 0.5mg QDS
- ○ Perform an Epley manoeuvre
- ○ Prednisolone 40mg a day with a tapering dose
- ○ Prochlorperazine 5mg

# VESTIBULAR NEURITIS

- Rapid onset of severe vertigo, nausea, vomiting, and imbalance.
- Symptoms gradually resolve over several days, but some symptoms can persist for months.
- Etiology - probably viral.
- Benign and self-limited

- Diagnosis - Peripheral vestibular pattern of nystagmus and a positive head-thrust test in the setting of a rapid onset of vertigo without other neurological symptoms.

What differentiates labyrinthitis or vestibular neuritis (VN)? from BPPV

---

| Labyrinthitis/VN | BPPV |
| --- | --- |
| a) No head movement needed | a. Requires head movement |
| b) Duration of hours/days | b. Duration of seconds |
| c) Any age | c. Usually in elderly |
| d) Viral syndrome usually precedes | d. No relation to viral syndrome |
| a) Epley maneuver is ineffective | e. Responds to Epley maneuver |

Prednisolone 40mg a day with a tapering dose 3%

Prochlorperazine 5mg ← 20%

Correct answer

The patient has likely vestibular neuritis, this can cause rapid onset vertigo with no hearing loss or tinnitus, which are often a feature of Labyrinthitis.

NICE guidelines suggest Prochlorperazine either as an IM or Buccal preparation to treat Vestibular Neuritis. The treatment should be taken for 3 days and then tailed off with treatment limited to one week.

Cinnarizine should be avoided in the elderly, especially women and those with a family history or evidence of Parkinson's disease.

**Reference:**

- CKS, Vestibular neuronitis

An 83 year old man is admitted to hospital following a fall at home. His wife died a year ago and he has been living on his own since. His daughter found him at home as she had popped in to see him after work. He told her that he had fallen an hour or so before and had not been able to get up. She tells you that he has had increasing problems looking after himself and has had a couple of falls prior to this. On this occasion, the patient explains to you that he has had increasing problems with his muscle strength and he simply tripped over and gashed his head. He did not pass out but was unable to get up.

Currently he takes amlodipine 10 mg/d, simvastatin 40mg/d and omeprazole 10mg/d.

On examination, he is frail and has a superficial laceration to the right temporal region which has not required stitching. Observations are fine but he has a BMI of 20.5kg/m2 and has obvious sarcopenia, particularly with proximal muscle weakness. His pulse is 80 bpm reg and blood pressure is 142/78 mmHg lying and standing.

Which of the following is the most appropriate treatment fall prevention strategy for this man?

- Stop amlodipine
- Stop omeprazole
- Thiamine treatment
- Topical testosterone treatment
- Vitamin D3 treatment

Stop amlodipine 11%

Stop omeprazole 5%

Thiamine treatment 4%

Topical testosterone treatment 4%

Vitamin D3 treatment ✔ 76%

Correct answer selected

This elderly male patient has had a mechanical fall at home resulting in his admission to hospital. This is a very common occurrence and, according to guidance, this patient should be treated with at least 800iu vitamin D3 as part of a fall prevention strategy. It is highly likely that the patient has vitamin D deficiency and this may contribute to the sarcopenia and proximal muscle weakness. There is no evidence of postural hypotension so there would be no requirement to stop the amlodipine.

A 95 year old lady was admitted to the MAU from her residential home on account of increased difficulty mobilising secondary to left hip pain. She had recently suffered a minor viral upper respiratory tract infection.

She had a past medical history of type 2 diabetes, hypertension and chronic renal impairment for which she took sitagliptin, bendrofluazide and Ramipril. She also took combined calcium and vitamin D3 supplements 1g daily of calcium and 800iu D3.

Other than hip pain that had progressed over a 2 year period, she denied feeling unwell. Specifically she denied thirst or frequency and otherwise reported no health concerns. There was no history of weight loss.

Her observations and examination were unremarkable beside mild hypertension, discomfort and stiffness of her left hip noted when internally rotated. She was observed mobilising on her tripod and was found to be functionally at her baseline.

Investigations revealed:

| | |
|---|---|
| Calcium | 2.9 mmol/l (2.2-2.6) |
| Alkaline Phosphatase | 70 iu/l (30-150) |
| Albumin | 40 g/dl (35-45) |
| Phosphate | 1.25 mmol/l (0.8-1.4) |
| Sodium | 143 mmol/l (134-144) |
| Potassium | 4.1 mmol/l (3.5-5.5 |
| Urea | 13 mmol/l (3-8) |
| Creat | 154 micromol/l (50-100) |

calcitonin

Admit for IV fluids – normal saline 34%

Admit for IV fluids with intravenous bisphosphonates 3%

Admit, treat with IV fluids and give denosumab 2%

Stop bendrofluazide, encourage liberal oral fluids, and discharge with view to repeating calcium in 2 days. ✔ Correct answer selected 59%

In this elderly lady's case the raised calcium is an incidental finding and she is on two medications that can precipitate hypercalcaemia – bendrofluazide and oral calcium – she may well have been tipped over causing this mild hypercalcaemia with her recent viral illness. She is mobilising reasonably well presently and an admission will likely adversely affect her functional state.

FBC, LFT and CRP were normal. Hip X-ray revealed moderate-severe osteoarthritis in her left hip, no fractures or other abnormalities. Simple analgesics were initiated and an outpatient referral to the orthopaedic team arranged. Her combined calcium and vitamin D3 supplements were stopped. Aside from this, how else would you manage her hypercalcaemia?

- Admit for IV fluids and give SC calcitonin
- Admit for IV fluids – normal saline
- Admit for IV fluids with intravenous bisphosphonates
- Admit, treat with IV fluids and give denosumab
- Stop bendrofluazide, encourage liberal oral fluids, and discharge with view to repeating calcium in 2 days.

A 59 year old woman attends A&E on a Saturday after suddenly developing dysarthria, diplopia, numbness and weakness of the right face and left hand which lasted approximately 2 hours. The symptoms have now resolved but she describes the symptoms coming on suddenly, over minutes. In her past medical history, she is treated for hypertension, hyperlipidaemia and has stable intermittent claudication not requiring any surgical intervention. She takes amlodipine, simvastatin and aspirin. She is a smoker of 5 cigarettes daily.

On examination, her pulse is 88 bpm irregular, BP 150/85 mmHg but neurological and cardiovascular examination is otherwise normal. There is no carotid bruit. CT scan is normal.

Investigations show normal routine blood tests and an ECG reveals atrial fibrillation.

Which of the following is the most appropriate approach to the management of this patient?

- ○ Admit, risk factor modification, anticoagulation and and arrange urgent specialist review
- ○ Admit, arrange urgent specialist review, echo and MRI as inpatient
- ○ Discharge with risk factor modification and review in TIA clinic
- ○ Discharge with risk factor modification, anticoagulation and review in TIA clinic
- ○ Discharge with risk factor modification

Admit, risk factor modification, anticoagulation and and arrange urgent specialist review ✔ Correct answer selected — 46%

Admit, arrange urgent specialist review, echo and MRI as inpatient — 27%

Discharge with risk factor modification and review in TIA clinic — 6%

Discharge with risk factor modification, anticoagulation and review in TIA clinic — 12%

Discharge with risk factor modification and anticoagulation following outpatient MRI with TIA clinic — 10%

This patient has presented with a typical TIA and requires risk factor assessment and modification, particularly blood pressure review and smoking cessation, together with anticoagulation – NOACS or warfarin are acceptable. The patient need not be admitted to facilitate this. There is a 10% risk of completed stroke following TLOF and this can be reduced by up to 80% with risk factor modification.

Recommendation from
https://cks.nice.org.uk/stroke-and-tia#!scenario:1

- Discuss the need for admission or observation urgently with a stroke specialist if the person:
  - Has had more than one suspected TIA (sometimes known as crescendo TIA).
  - Has a suspected cardioembolic source or severe carotid stenosis. (our case fits in this category)
  - May be unable to attend for urgent review or lacks a reliable observer at home to contact emergency services if further symptoms occur.

Ufone 2:29 PM 7%
studyprn.com

Peer responses

- First presentation of dementia 3%
- Hypoglycemic event 0%
- Temporal lobe epilepsy 1%
- Transient ischaemic attack 1%
- Transient global amnesia ✔ 95%

Correct answer selected

The nature of the symptoms – constant questions, then rapid full recovery with no memory of the event – is strongly suggestive of Transient global amnesia.

**Further reading**

- Transient Global Amnesia

Next

Exit

A 75 year old female was assessed in A&E having been brought into hospital by her husband in a confused state. They had been walking back from the shops and he stated that she started constantly asking where they were and what they had just been doing. This continued in the emergency department but by the evening post take ward round she was back to her normal self, although she couldn't recall the events of the day. The husband who was with her the whole time did not observe any limb weakness or facial asymmetry. Observations and bloods were unremarkable.

The most likely diagnosis is?

- First presentation of dementia
- Hypoglycemic event
- Temporal lobe epilepsy
- Transient ischaemic attack
- Transient global amnesia

An 83 year old woman is admitted from home following a fall and sustaining a fracture of the humerus. On this occasion, the patient explains to you that she has had increasing problems with weakness and she fell over injuring her arm. She has had a number of falls previously but, on this occasion, she fractured her humerus and was seen by the A&E team, who recommended a sling and immobilisation. They have requested a medical opinion as it is unlikely the patient can be discharged due to social circumstances. You establish she did not pass out and this was a mechanical fall.

Currently she takes amlodipine 10 mg/d, simvastatin 40mg/d and omeprazole 10mg/d.

On examination, she has a BMI of 20 kg/m2 and her left arm is in a sling. There is little else to note other than loss of muscle bulk and proximal weakness.

Investigations reveal:

| | |
|---|---|
| Sodium | 136 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 12.1 mmol/l (3-8) |

An 81 year old man is admitted following a fall at home. It was a mechanical fall but he stumbled and cracked his head. He is not sure if he passed out or not but was dazed, gashed the side of his head and called an ambulance. In his past medical history, he takes apixaban for lone atrial fibrillation.

On admission his GCS was 15, he had a laceration to his left temporal region which had now stopped bleeding. Neurological examination was normal but a CT head scan was performed and it revealed a left subdural haematoma. On coming back from CT scan, his GCS deteriorated to 12. The neurosurgeons were contacted and intend to transfer for urgent evacuation.

Which of the following should be undertaken prior to surgery?

- Give fresh frozen plasma
- Give IV prothrombin complex concentrate
- Give IV tranexamic acid
- Give IV vitamin k
- No prior treatment required; patient can undergo neurosurgery

Peer responses

| | |
|---|---|
| Diabetic amyotrophy | 5% |
| Osteomalacia ✔ Correct answer selected | 66% |
| Polymyalgia rheumatica | 5% |
| Primary hypoparathyroidism | 12% |
| Statin-induced myositis | 14% |

This elderly woman has fallen and sustained a fracture. She has proximal muscle weakness associated with a low calcium and elevated alkaline phosphatase. This suggests vitamin D deficiency – osteomalacia. The patient should be treated with vitamin D supplementation with or without supplemental calcium, depending on her nutritional intake. A reasonable approach to treating vitamin D deficiency is either D3 3200iu daily for 3 months or 60000 weekly for 5 weeks, followed by a maintenance dose of 800iu daily. Guidance suggests a reduction in falls associated with vitamin D therapy and that it is a very common entity in the elderly, a consequence of reduced sunlight exposure and reduced ability to photosynthesise D3 in the skin.

It is not PMR as this would not account for the hypocalcaemia and similarly the CRP does not suggest an underlying inflammatory process.

| | |
|---|---|
| Creatinine | 128 micromol/l (50-100) |
| Haemoglobin | 13.3 g/l (120-160) |
| White cell Count | $4.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |
| C-Reactive Protein | 5 mg/dl (<5) |
| Glucose | 6.4 mmol/l (3.5-5.5) |
| Calcium | 2.16 mmol/l (2.2-2.6) |
| Alkaline Phosphatase | 135 iu/l (50-120) |

Which of the following is the likely contributory diagnosis to this patient's fall?

- (●) Diabetic amyotrophy
- ( ) Osteomalacia
- ( ) Polymyalgia rheumatica
- ( ) Primary hypoparathyroidism
- ( ) Statin-induced myositis

Admit and request specialist review 6%

Admit, give antiplatelet therapy and specialist review ✔ Correct answer selected 61%

Discharge with no further follow up required 0%

Discharge without antiplatelets and refer to TIA clinic 0%

Give aspirin, discharge and organise TIA clinic referral 32%

This patient presents with transient loss of function which is typical of TIAs within the carotid territory. This is crescendo TLOF where 2 or more events occur within 1 week, signifying a bad prognosis. The patient requires admission as there is a significant risk of a full blown stroke, and also requires appropriate specialist stroke review with risk factor assessment including carotid dopplers and echo.

to surgery?

Peer responses

| | |
|---|---|
| Give fresh frozen plasma | 12% |
| Give IV prothrombin complex concentrate ✔ Correct answer selected | 70% |
| Give IV tranexamic acid | 6% |
| Give IV vitamin k | 1% |
| No prior treatment required; patient can undergo neurosurgery | 11% |

This patient is taking one of the direct oral anticoagulants (NOAC), apixaban which is a direct Xa inhibitor and has developed a subdural haematoma following a fall. Surgery is deemed necessary due to clinical deterioration and therefore the anticoagulative effect of apixaban should be reversed with a PCC such as octaplex or factor vIIIa inhibitor bypass activity.

**Reference:**

the event of cardiopulmonary arrest was not in his best interests.

He remained well in the department and his bloods were repeated 6 hours later with a haemoglobin of 13 g/l.

Which of the following would you advocate is the most appropriate plan here aside stopping his aspirin and starting proton pump inhibitors?

- Admit and refer to surgeons for review
- Admit for an inpatient endoscopy
- Admit overnight for observation and repeat FBC tomorrow and manage according to that result
- Discharge and arrange outpatient endoscopy
- Discharge with advice for his GP to review him should there be further concerns

Peer responses

- Admit and request specialist review — 6%
- Admit, give antiplatelet therapy and specialist review ✔ Correct answer selected — 61%
- Discharge with no further follow up required — 0%
- Discharge without antiplatelets and refer to TIA clinic — 0%
- Give aspirin, discharge and organise TIA clinic referral — 32%

This patient presents with transient loss of function which is typical of TIAs within the carotid territory. This is crescendo TLOF where 2 or more events occur within 1 week, signifying a bad prognosis. The patient requires admission as there is a significant risk of a full blown stroke, and also requires appropriate specialist stroke review with risk factor assessment including carotid dopplers and echo.

Ufone 6:59 PM 43%
studyprn.com

(c) Admit for an inpatient endoscopy 16%

(d) Admit overnight for observation and repeat FBC tomorrow and manage according to that result 39%

(e) Discharge and arrange outpatient endoscopy 12%

(f) Discharge with advice for his GP to review him should there be further concerns ✔ Correct answer selected 32%

As this gentleman has end stage Alzheimer's and his management is primarily about symptom support and tender loving care, further investigation is not required and a palliative management plan should be developed. A cause is apparent in relation to his aspirin therapy and his results do not suggest substantial blood loss based on the normal urea, wet pads (suggesting uncompromised urine output) and a repeat Hb that is reassuring.

An elderly man with advanced Alzheimer's Dementia (bed bound, uncommunicative, very limited understanding, doubly incontinent and on a thickened diet) was admitted by ambulance to A&E from his nursing home on account of haematemesis. He had 2 episodes: one in the nursing home and a second witnessed by the paramedics. The volume was estimated to have been about 20ml/episode. His usual medication included aspirin.

On examination, he appeared comfortable, with no apparent epigastric tenderness; his observations were normal (respiratory rate 18, saturations 97% on air, blood pressure 140/90, pulse 88bpm). His pads were wet and there was no melaena on rectal examination.

His bloods returned revealing a haemoglobin 140 g/l (120-160), white cell count 7x109/l (3-10), platelet 200x109/l (200-400), U&E, lactate and coagulation screen were normal.

His condition was discussed with his family and they agreed with the clinician that resuscitation in the event of cardiopulmonary arrest was not in his best interests.

He remained well in the department and his bloods

A 75 year old woman presents to the MAU on Sunday with recurrent episodes of right hand numbness and slurred speech which have occurred on approximately 10 occasions over the last 2 weeks. The episodes are all very similar in nature, each lasting 10 to 40 minutes with complete resolution of the weakness and numbness. They tend to occur at any time of day and come on quite suddenly. In her past history she has been treated for hypertension with amlodipine and also takes simvastatin. She had a right hip replacement 3 years ago which was uneventful.

On examination, she feels that her symptoms have now entirely resolved and there are no neurological deficits on examination. Blood pressure is 136/84 mmHg. CT head scan is reported as normal.

Which of the following is the most appropriate approach to the management of this patient?

- ○ Admit and request specialist review
- ○ Admit, give antiplatelet therapy and specialist review
- ○ Discharge with no further follow up required
- ○ Discharge without antiplatelets and refer to TIA clinic
- ○ Give aspirin, discharge and organise TIA clinic referral

Ufone 6:59 PM 43%
studyprn.com

(c) Admit for an inpatient endoscopy 16%

(d) Admit overnight for observation and repeat FBC tomorrow and manage according to that result 39%

(e) Discharge and arrange outpatient endoscopy 12%

(f) Discharge with advice for his GP to review him should there be further concerns ✔ Correct answer selected 32%

As this gentleman has end stage Alzheimer's and his management is primarily about symptom support and tender loving care, further investigation is not required and a palliative management plan should be developed. A cause is apparent in relation to his aspirin therapy and his results do not suggest substantial blood loss based on the normal urea, wet pads (suggesting uncompromised urine output) and a repeat Hb that is reassuring.

Question ID #4222

An 80 year old woman was admitted to A&E following a collapse in church. She had a medical history of hypertension maintained on ramipril, amlodipine and atenolol. She also takes aspirin 75mg daily as she had a TIA in the past. She is usually independent and lives with her husband who is in good health for his age. Six months ago she recalls a similar episode whilst waiting at the bus stop on a hot day. She recalled standing still during the church service and feeling light headed and nauseous around the time of the collapse. She believes she blacked out. Witnesses observed her to jerk as she hit the floor but she was alert and able to speak coherently within minutes of the event. Assessment revealed a bump on her brow otherwise neurological, cardiovascular and systems examinations were unremarkable. Her GCS was 15. Her ECG revealed sinus rhythm with a heart rate of 50 bpm and her blood pressure was recorded as 110/70 mmHg with no postural drop. Her routine bloods were satisfactory as was a CT of her head. ECG reveals sinus rhythm with a rate of 50/min. What do you believe is the most appropriate management aside stopping the atenolol?

An 87-year-old woman presents to you with symptoms of dizziness which developed a few weeks ago. She finds the symptoms very difficult to describe, but she states she feels very unstable and it is hard to maintain her balance. These episodes occur on sudden standing and on movement, especially on looking upwards and bending over. She says she feels nauseous during the episodes, which last around a minute, although she feels lightheaded for up to a few hours after the event. She has fallen on standing when getting out of bed and when out shopping in the past week.

She has a history of hypertension and ischaemic heart disease, and is on bisoprolol, ramipril and clopidogrel.

On examination she has a lying blood pressure of 118/78 mmHg and a resting heart rate of 70 bpm (sinus rhythm). Her standing blood pressure is 115/75 mmHg immediately and 120/82 mmHg after 3 minutes of standing, and her heart rate remains stable at 70 bpm throughout the examination. She has no obvious focal neurology when reclining on an examination bench and examination of the cranial nerves is normal.

Admit and refer for a cardiology opinion 6%

Admit overnight for observation and arrange a 24 hour tape for further investigation as an outpatient ← Correct answer 53%

Discharge and arrange a cardiology outpatient referral ✖ Incorrect answer selected 12%

Discharge with head injury advice, stop aspirin and advise GP to monitor antihypertensive therapy 29%

No further action or investigations required as it was a one off fall 0%

The history here is typical of a vasovagal collapse (vagal symptoms- low BP and Heart rate; lightheadedness and nausea) and does not suggest cardiac syncope (typically no warning symptoms often associated with significant injuries). In addition her low BP and bradycardia are contributing to her susceptibility to faint and are probably related to the beta blockade. Hence stopping the beta blocker is appropriate. In view of bradycardia it is possible that she may be having pauses contributing to falls, hence a 24 hour tape esp after stopping atenolol - if bradycardia persist- may be a reasonable option.

- Benign paroxysmal positional vertigo — 68%
  ✔ Correct answer selected
- Hyperventilation syndrome — 1%
- Meniere's disease — 7%
- Orthostatic/postural hypotension — 12%
- Vestibular neuritis/labyrinthitis — 11%

The patient is complaining of dizziness with specific movements of her head; these can include looking upwards, turning in bed or bending over.

The vertigo involved normally lasts a few seconds to a minute (usually less than 30 seconds), and feelings of nausea may develop, although vomiting is rare, and lightheadedness and imbalance may be reported which can last for hours after the attack.

Hearing loss and tinnitus are not features of benign paroxysmal vertigo (unless pre-existing).

The Dix-Hallpike test (manoeuvre) is used to diagnose benign paroxysmal positional vertigo.The above patient has no contraindications to this test which include back and neck problems and carotid stenosis.

The below is a video of this test:

of her head. ECG reveals sinus rhythm with a rate of 50/min. What do you believe is the most appropriate management aside stopping the atenolol?

- ○ Admit and refer for a cardiology opinion
- ○ Admit overnight for observation and arrange a 24 hour tape for further investigation as an outpatient
- ○ Discharge and arrange a cardiology outpatient referral
- ○ Discharge with head injury advice, stop aspirin and advise GP to monitor antihypertensive therapy
- ○ No further action or investigations required as it was a one off fall

remains stable at 70 bpm throughout the examination. She has no obvious focal neurology when reclining on an examination bench and examination of the cranial nerves is normal.

Examination of her cardiovascular, respiratory and abdominal systems is unremarkable.

What is the most likely diagnosis?

- Benign paroxysmal positional vertigo
- Hyperventilation syndrome
- Meniere's disease
- Orthostatic/postural hypotension
- Vestibular neuritis/labyrinthitis

A 70 year old man presents after a transient ischaemic attack involving weakness of the left arm and lasting approximately 2 hours. He has a past medical history of diabetes for which he takes metformin 1g bd, together with simvastatin 40mg daily and ramipril 10mg daily.

On presentation, his weakness has now entirely resolved. He has a pulse of 80 bpm regular and a blood pressure of 148/92 mmHg.

Which of the following denotes this man's ABCD2 score?

- 1
- 3
- 5
- 6
- 7

Cerebrospinal Fluid analysis 1%

Cervical spine X ray with flexion / extension views, and MRI cervical spine 88% ✔

Correct answer selected

MRI Brain 4%

MRI lumbar spine 3%

Nerve conduction studies / electromyography 3%

Atlanto axial instability affects between 12 and 33% of patients with rheumatoid arthritis 1-3. Assessing the atlanto-axial joint requires cervical spine radiographs in flexion and extension in the first instance, followed by magnetic resonance imaging of the cervical portion of the spinal cord[4]. An urgent spinal and neurosurgical opinion should be sought.

Although a primary brain disorder such as sagittal sinus thrombosis, space occupying lesions or demyelination could be considered in the differential diagnosis, in a rheumatoid arthritis patient with neck pain, tetraplegia and upper motor neurone signs, atlantoaxial instability must be considered first. Imaging of the brain and lumbar puncture is therefore less relevant. Nerve conduction studies / electromyography would not be helpful, and imaging the lumbar spine would miss a higher central spinal cord lesion.

References

A 66 year old woman who has type 2 diabetes presents with a hot swollen knee. She also has cellulitis affecting the same leg distally. Aspiration of the knee is performed and culture of the fluid grows Staph Aureus. She is started on IV flucloxacillin and benzyl penicillin as per local protocol.

She is keen to go home. How long should you tell her she is likely to remain on antibiotics?

- ○ IV antibiotics for 12 weeks
- ○ IV antibiotics for 2 weeks followed by 4 weeks of oral antibiotics
- ○ IV antibiotics for 4 weeks followed by 6 weeks of oral antibiotics
- ○ IV antibiotics for 6 weeks
- ○ IV antibiotics for 6 weeks followed by 4 weeks of oral antibiotics

Carotid and vertebral artery Doppler scan 29%

Echocardiography ✔ Correct answer selected 25%

Lower limb Venous Doppler 4%

MRI Brain 16%

Antiphospholipid syndrome was first described by Hughes in 1983[1]. The most common cardiac manifestation of the disease is a non-bacterial thrombotic endocarditis[2], caused by platelet-fibrin thrombi forming on the endocardial surface of valves, with a prevalence of 11.6% reported[3]. An echocardiogram is an essential investigation for any patient presenting with a cerebral embolism to exclude an underlying cardiac cause such as mural thrombus, atrial myxoma, valvular vegetations, patent foramen ovale, and atrial or ventricular septal defects. Since her lupus anticoagulant and anti cardiolipin antibodies are both positive, testing for anti-beta2 glycoprotein1 antibodies would not provide any additional information at this stage. A repeat antiphospholipid screen in 12 weeks' time may be considered, but this is not relevant to this particular question. At her age she is unlikely to have significant atherosclerotic involvement of her carotid arteries to warrant a carotid arterial Doppler. If a paradoxical embolus was suspected, then an echocardiogram would be more urgently required than a venous Doppler scan of the leg. Her history does not suggest a cerebral vasculitis or encephalitis and therefore MRI would not take precedence over echocardiography in this case.

A 24 year old lady is admitted under the acute medical team with sudden onset expressive dysphasia and right sided hemiplegia. She has suffered from migraine since the age of 16.

Clinical examination confirms increased tone in the right arm and leg. Power is graded 4/5 in all muscle groups of the right arm and leg and is 5/5 on the left. There is generalised hyper-reflexia and the right plantar is extensor. Sensation to light touch and vibration sense is preserved.

Investigations

CT Brain: Infarct in the left frontal lobe in the territory of the left middle cerebral artery.

| | | |
|---|---|---|
| **Anti dsDNA** | 5 U/L | (<20 U/L) |
| **ESR** | 32 mm/h | (0-10mm/h) |
| **CRP** | 39 mg/L | (<7mg/L) |
| **Lupus Anticoagulant** | Positive | |
| **Anti Cardiolipin IgG** | 45 GPLU/ml | (<10) |
| **Anti Cardiolipin** | 50 MPLU/ml | (<7) |

A 27 year old man is referred urgently by his general practitioner with right shoulder pain. He is on no medication but admits to using intravenous heroin on a regular basis. On examination, he is pyrexial ($38.1^0$C) and examination of the anterior chest wall reveals tenderness and swelling over the right sternoclavicular joint. He has no other joint abnormalities.

An ultrasound is performed which reveals a fluid collection around the sternoclavicular joint. This is aspirated and 2mls of turbid fluid is sent for analysis. He is commenced on broad spectrum antibiotics intravenously. The culture is positive 24 hours later.

Given his history which of the following is the most likely cause of his septic arthritis?

- ○ Haemophilus influenzae
- ○ Polymicrobial infection
- ○ Pseudomonas aeruginosa
- ○ Staphyloccocus aureus
- ○ Streptococcus pneumoniae

Serum Electrophoresis - increased alpha and beta globulins, no paraprotein detected.
Urine electrophoresis - Bence jones protein not detected

Lumbar spine X ray - Mild degenerative lumbar spondylotic changes.
Chest X Ray - Clear lung fields.

Which of the following is the most likely diagnosis?

- Infective discitis
- Lumbar spondylosis
- Multiple myeloma
- Osteoporotic fracture
- Rheumatoid vasculitis

A 43 year old man is admitted under the general medical intake with generalised progressive weakness of his arms and legs. During the preceding 5 days he complained of flu like symptoms and muscle aches. There is no change in his symptoms after exercise such as walking up a flight of stairs. He compares the discomfort in his legs to a "swarm of bees crawling over his thighs". He has noticed difficulty in swallowing but no nasal regurgitation of liquids. His speech and facial expression remain unchanged. There is no family history of muscle disorders.

On examination he displays marked truncal weakness and has difficulty even to sit upright. He has difficulty holding his head up. The muscle bulk of his arms and legs appear normal with no wasting or hypertrophy. There is no fasciculation of the muscles. His limb tone is reduced, and power graded 3/5 on hip flexion and shoulder abduction. Cranial nerve examination is normal. Respiratory examination is unremarkable.

| | | |
|---|---|---|
| **CK** | 13,000 U/L | (30-200 U/L) |
| **CRP** | 120mg/L | (<5mg/L) |
| **ESR** | 87 mm/h | (<10mm/h) |

Urine dipstick: No abnormality detected

Ufone 12:16 PM 31%
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- Lyme Disease — 36%
- Reactive arthritis — 6%
- Sarcoidosis ✔ Correct answer — 35%
  selected
- Sjörgren's Syndrome — 16%

The combination of uveitis, parotiditis and a facial nerve palsy (Heerfordt's syndrome) is highly suggestive of sarcoidosis. The normal serum ACE in this man should not exclude the diagnosis of Sacroidosis and even if elevated is not diagnostic. The other diseases listed may share many of the features of sarcoidosis particularly Sjörgren's Syndrome. Chronic granulomatous disease is a primary immune deficiency syndrome which usually presents early in life with recurrent infections but an X-linked form of the disease can present in adulthood.

Which of the following are Pulmonary Function Tests most likely to show?

Peer responses

| | |
|---|---|
| A reduced transfer factor | 27% |
| An increased transfer factor ✔ Correct answer selected | 45% |
| An increased FVC | 5% |
| A reduced FEV1/FVC | 7% |
| A reduced FVC | 17% |

This lady is likely to have developed a degree of alveolar haemorrhage secondary to her ANCA positive vasculitis. Although over time recurrent alveolar haemorrhage can lead to fibrosis and a reduced transfer factor, acutely the presence of haemoglobin in the airways increases the DLCO.

Reference:

Kumar and Clark.Clinical medicine 7th edition. Saunders limited 2009.

ANCA 19%

Renal and coeliac Angiography 25%

✔ Correct answer selected

CT abdomen and pelvis 15%

Skin biopsy 41%

USS abdomen 1%

This patient presents with non specific features but diffuse abdominal pain and a positive urine dipstick with mild renal impairment. Although all the above investigations may be required to rule out other causes for these symptoms the main differential in this man is between Polyarteritis Nodosa (PAN) and Microscopic polyangiitis (MP). Although p-ANCA is usually positive in MP this is not always the case however the findings of aneuryms, segmental arterial narrowing and pruning of the peripheral vascular tree is seen in PAN but not MP making this the most likely test to confirm the diagnosis.

PAN is now divided into classical PAN and that associated with Hepatitis B infection. This distinction is important as management is different with Hepatitis B associated PAN being treated with antiviral agents and plasma exchange in addition to steroids in the first instance. Cyclophosphamide and steroid induction therapy remains the mainstay of treatment for non-Hepatitis B associated PAN.

| | |
|---|---|
| **RF** | negative |
| **ANA** | positive 1:160 |
| **ENA** | negative |
| **ANCA** | 1:1280 MPO positive |
| **C3/C4** | normal |

Chest x-ray shows diffuse patchy shadowing at both bases.

You arrange pulmonary function tests.

Which of the following are Pulmonary Function Tests most likely to show?

- ○ A reduced transfer factor
- ○ An increased transfer factor
- ○ An increased FVC
- ○ A reduced FEV1/FVC
- ○ A reduced FVC

A 74 year old lady presents with a history of gradual weakness in her legs to an extent that she can no longer walk. She complains of back pains and numbness down both legs leading up to this presentation. There is no history of urinary or faecal incontinence. She has no significant past medical history except for previous carpal tunnel syndrome release and cervical spondylosis. On examination you find that there is full power in her upper limbs with intact reflexes and sensation. The legs are weak with absent knee and ankle jerks. There is loss of sensation to pinprick at the big toes of both feet, soles, and the back of both legs. There is perianal numbness and reduced sphincter tone.

What is the next appropriate investigation?

- Isotope bone scan
- MRI Cervical spine
- MRI Lumbar spine
- Nerve conduction studies
- Xray lumbar spine

A 55 year old man is seen on the acute medical ward with a month long history of fever, myalgia, arthralgia and abdominal discomfort. Examination reveals no synovitis but diffuse abdominal tenderness and a few scattered subcutaneous nodules. Urine dipstick is positive for blood and protein. Initial investigations are as follows:

| | | |
|---|---|---|
| **CRP** | 95 mg/dl | (<5) |
| **ESR** | 72 mm/hr | (0-10) |
| **WBC** | 13 x$10^9$/l | (4-11) |
| **Creatinine** | 135 umol/L | (50-100) |
| **ANA** | Negative | |

Which of the following is most likely to confirm the diagnosis in this patient?

- ANCA
- Renal and coeliac Angiography
- CT abdomen and pelvis
- Skin biopsy
- USS abdomen

A 69 year old woman is being seen in the rheumatology clinic for a number of months with a polyarthralgia and mild weight loss. Her GP has requested admission as she has lost a further stone in the last month and is suffering with fevers and a cough productive of rusty sputum. Her investigations are as follows;

| | | |
|---|---|---|
| **Haemoglobin** | 9.7 g/dl | (13.5-17.7 g/dl) |
| **MCV** | 68 fl | (83-98 fl) |
| **WCC** | 14.8x$10^9$/l | (4-11 x$10^9$/l) |
| **Neutrophils** | 8.9x$10^9$/l | (2.0-7.5 x$10^9$/l) |
| **Lymphocytes** | 4.2 x$10^9$/l | (1.5-4.0 x$10^9$/l) |
| **Eosinophils** | 0.7 x $10^9$/l | (0.04-0.4 x$10^9$/l) |
| **Platelets** | 428 x$10^9$/l | (150-400 x$10^9$/l) |
| **Creatinine** | 122 ?mol/l | (79-110? mol/l) |
| **RF** | negative | |
| **ANA** | positive 1:160 | |

A 45 year old plumber is admitted to the acute medical ward with generalised arthralgia and an inflamed left eye confirmed as uveitis by the ophthalmologists. Examination reveals bilateral parotid swelling and an effusion of the left knee and synovitis of both wrists.

Initial investigations demonstrate:

| | |
|---|---|
| **Haemoglobin** | 12.9 g/dl (13.5-17.7) |
| **Creatinine** | 75 umol/L (50-100) |
| **ESR** | 65 mm/hr (0-10) |
| **CRP** | 43 mg/dl (<5) |
| **ANA** | Negative |
| **Rheumatoid Factor** | Negative |
| **Serum ACE level** | 40 IU/L (8-52) |

2 days after admission the patient is reviewed on the ward round and noted to have developed a left sided seventh cranial nerve palsy.

What is the most likely diagnosis?

- ○ Chronic granulomatous disease
- ○ Lyme Disease
- ○ Reactive arthritis
- ○ Sarcoidosis
- ○ Sjörgren's Syndrome

Polymyositis ✔ Correct answer 56%

selected

Rhabdomyolysis 2%

Although there is a tendency to overdiagnose polymyositis, this is the most likely diagnosis of the options listed. The presence of symmetrical proximal muscle weakness, dysphagia, elevated CK, and myopathic EMG findings are highly suggestive of polymyositis. Alanine (ALT) and aspartate (AST) transaminases are often raised in polymyositis. A muscle biopsy would be needed to confirm the diagnosis. It is important to determine this patient's autoantibody status, particularly with regard to anti-tRNA synthetase antibodies- which are positive in 30% of polymyositis patients (also known as Anti-Jo1 antibodies) - since this is associated with interstitial lung disease, Raynaud's phenomenon, "mechanic's hands" (manifest as roughened cracked skin of the fingers), and arthritis. The presence of anti-synthetase antibodies carries a poorer prognosis[1].

Myoglobinuric acute renal failure has been reported in polymyositis, but is rare[2]. The absence of fasciculation and bulbar symptoms, and myopathic EMG findings makes motor neurone disease unlikely. Limb-girdle dystrophy is typically characterised by marked hypertrophy of the calves, but with gross muscle weakness. This gentleman's muscle bulk appears normal, making limb girdle dystrophy unlikely. McArdle's syndrome is characterised by a "second wind phenomenon" where patients experience weakness on exercise, but then following a brief period of rest the muscle power returns significantly better than before. During exacerbations of McArdle's disease patients may be at risk of rhabdomyolysis. His

Urine dipstick: No abnormality detected.

Urine myoglobin: Not detected.

| | | |
|---|---|---|
| **Sodium** | 135 mmol/L | (135-145) |
| **Potassium** | 4.3 mmol/L | (3.5-5.0) |
| **Urea** | 5.9 mmol/L | (2.5-7.0) |
| **Creatinine** | 105 micromol/L | (70-110) |
| **25OHVit D** | 52 ng/L | (desirable levels > 30ng/L) |
| **Free T4** | 20.8 pmol/l | (9.8 - 23.8) |
| **TSH** | 2.2 mu/l | (0.5-4.5) |

Electromyography is reported as:
Myopathic potentials: low amplitude, short duration polyphasic units on voluntary activation. Increased spontaneous activity with fibrillations and complex repetitive discharges.

Which is the most likely diagnosis?

- ○ Limb-girdle muscular dystrophy
- ○ McArdle's syndrome
- ○ Motor neurone disease
- ○ Polymyositis
- ○ Rhabdomyolysis

A 78 year old lady with rheumatoid arthritis and type 2 diabetes mellitus presents with a chesty productive cough. Her medications include Metformin 1g bd, Methotrexate 15mg weekly, Folic acid 5 mg daily, and Prednisolone 5mg od. She is treated at home for a chest infection with a one week course of amoxycillin and makes a good recovery. Six weeks later she presents with severe lower lumbar back pain and is noted to have a temperature of 37C, a pulse of 100 bpm and a blood pressure of 138/78 mmHg. She is noted to have a left foot drop and a rash over the left shin which is waxy brown-yellow in colour.

Her investigations reveal:

| | | |
|---|---|---|
| **Haemoglobin** | 12.9 g/dL | (13 - 18 g/dL) |
| **WBC** | 15.3 $x10^9$/L | (4 -11 $x10^9$/L) |
| **Neutrophils** | 12.1 x $10^9$/L | (2 - 8 $x10^9$/L) |
| **Platelets** | 514 $x10^9$/L | (150 - 400 $x10^9$/L) |
| **CRP** | 53 mg/L | (< 10 mg/L) |
| **ESR** | 74 mm/hr | (< 40 mm/hr) |
| **Ig M** | 2.4 g/L | (0.4 -2.3 g/L) |
| **Ig A** | 7.8 g/L | (0.6 -5.0 g/L) |
| **Ig G** | 12.1 g/L | (6.0 - 15.6 g/L) |

Serum Electrophoresis - increased alpha and beta globulins, no paraprotein detected.

Peer responses

| | | |
|---|---|---|
| Infective discitis ✔ Correct answer selected | Correct | 55% |
| Lumbar spondylosis | | 1% |
| Multiple myeloma | | 3% |
| Osteoporotic fracture | | 2% |
| Rheumatoid vasculitis | | 39% |

This lady has risk factors for infection - Type 2 Diabetes Mellitus and immunosuppression with methotrexate for rheumatoid arthritis. Probable haematogenous spread of infection after the recent chest infection, seems the most probable cause of the presentation, resulting in seeding of the infection at the lumbar intervertebral disc. She has nerve root signs at L4/5 with weak tibialis anterior affecting ankle dorsiflexion. Incidentally, the rash is the description of necrobiosis lipoidica diabeticorum, and not erythema nodosum or a vasculitis rash. Less than 50% of infective discitis patients have fever. Urgent MRI imaging is first choice here. CT guided biopsy can help to identify an organism if blood cultures remain negative, but only in 50% of cases. Staph. aureus and coagulase negative Staphylococci are the most common organisms. Tuberculosis should always be considered on the list of differential diagnoses in the immunosuppressed patient. The waxy-brown rash on the shin is a red herring and in this patient with diabetes suggests necrobiosis lipoidica diabeticorum.

| | | |
|---|---|---|
| ○ | Haemophilus influenzae | 1% |
| ○ | Polymicrobial infection | 2% |
| ○ | Pseudomonas aeruginosa | 5% |
| ✔ | Staphyloccocus aureus | 91% |

Correct answer selected

| | | |
|---|---|---|
| ○ | Streptococcus pneumoniae | 2% |

Infection of the sternoclavicular joint is rare but represents 17% of joint infections in IV drug users versus 1% in the general population. Pseudomonas aeruginosa joint infection is considered to be more common in IV drug users but Staphylococcus aureus infection still remains the most common infective agent based on a recent review of 180 cases[1]. Despite this it may be important to cover both staphylococcal and pseudomonas infection until culture results are available in this patient.

Reference:

1. Ross JJ, Shamsuddin H. Sternoclavicular

| | | |
|---|---|---|
| **Anti Cardiolipin IgM** | 50 MPLU/ml | (<7) |
| **Factor V Leiden mutation:** | Not detected. | |
| **Protein C activity** | 118% | (76-208%) |
| **Protein S activity** | 111% | (62-153%) |
| **Anti thrombin III** | 0.9 kIU/L | (0.8-1.2 kIU/L) |
| **Homocysteine** | 5.5micromol/L | (4.9-11.6micromol/L) |

ECG: sinus rhythm, 80 beats per minute, normal axis, normal morphology.

Which of the following is the next most appropriate investigation?

- ○ Anti Beta 2 Glycoprotein 1 Antibodies
- ○ Carotid and vertebral artery Doppler scan
- ○ Echocardiography
- ○ Lower limb Venous Doppler
- ○ MRI Brain

Ufone 10:45 AM 45%
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A 27 year old man is referred urgently by his general practitioner with right shoulder pain. He is on no medication but admits to using intravenous heroin on a regular basis. On examination, he is pyrexial ($38.1^0$C) and examination of the anterior chest wall reveals tenderness and swelling over the right sternoclavicular joint. He has no other joint abnormalities.

An ultrasound is performed which reveals a fluid collection around the sternoclavicular joint. This is aspirated and 2mls of turbid fluid is sent for analysis. He is commenced on broad spectrum antibiotics intravenously. The culture is positive 24 hours later.

Given his history which of the following is the most likely cause of his septic arthritis?

- Haemophilus influenzae
- Polymicrobial infection
- Pseudomonas aeruginosa
- Staphyloccocus aureus
- Streptococcus pneumoniae

Mark Skip Exit

IV antibiotics for 2 weeks followed by 4 weeks of oral antibiotics — 79% ✓

Correct answer selected

IV antibiotics for 4 weeks followed by 6 weeks of oral antibiotics — 7%

IV antibiotics for 6 weeks — 11%

IV antibiotics for 6 weeks followed by 4 weeks of oral antibiotics — 2%

Although there is no strong evidence base empirically clinicians use a regime of 2 weeks of sensitive IV antibiotics followed by 4 weeks of oral antibiotics. This is obviously guided by the patients response to therapy and as well as clinical response, white cell count and CRP should be repeated to monitor the response to antibiotics. As she is diabetic she is at increased risk of infection in the first place. Other risk factors include;

1. Previous joint disease (including osteoarthritis)
2. Immunocompromise
3. Low socio-economic status
4. Intravenous drug abuse
5. Alcoholism
6. Cutaneous ulcers of any origin

C J Mathews, G Kingsley, M Field, A Jones, V C

Prednisolone 10 mg per day ← 14%

Correct answer

Prednisolone 10 mg per day and Methotrexate 15%

Prednisolone 40 mg per day 33%

Prednisolone 40 mg per day and Methotrexate 31%

Prednisolone 60 mg per day ✖ 8%

Incorrect answer selected

The case presented above is typical for the diagnosis of remitting seronegative symmetrical synovitis with pitting edema (RS3PE). This is an inflammatory condition of acute onset which presents with sudden onset polyarthritis associated with bilateral pitting oedema of both hands and lower limbs in older patients (usually men) and is rheumatoid factor negative. The main differentials for this condition are late onset Rheumatoid arthritis, polymyalgia rheumatica, crystal arthropathy and also paraneoplastic syndromes which have frequently been reported in association with this condition. A particular feature of RS3PE is that it is very sensitive to the introduction of low dose oral steroids at a dose of 10-15 mg. If there is a poor response to steroids with the typical features of the condition a paraneoplastic cause may need to be pursued.

A 66 year old lady with a 20 year history of seropositive erosive rheumatoid arthritis presents with a two week history of deteriorating weakness and neck pain. She has noticed neck pain and a sensation that her head is slumping forwards. Her arms and legs feel generally weak and she has complained of urinary hesitancy and constipation in the past week.

Clinical examination reveals painful restricted neck movements. Tone is increased in the upper and lower limbs. There is proximal weakness graded 4/5 on shoulder abduction and hip flexion bilaterally. Biceps and knee jerk reflexes are bilaterally brisk.

What is the most appropriate investigation?

- ○ Cerebrospinal Fluid analysis
- ○ Cervical spine X ray with flexion / extension views, and MRI cervical spine
- ○ MRI Brain
- ○ MRI lumbar spine
- ○ Nerve conduction studies / electromyography

A 74 year old man is referred urgently from his general practitioner with new onset arthropathy mainly affecting his hands. This had increased in severity over the last 2 months. His only medication prior to this event was omeprazole for occasional indigestion.

Examination revealed symmetrical synovitis of his wrists and proximal interphalangeal joints, he also had marked oedema of the dorsum of his hands and pitting oedema up to his knees. He has recently commenced frusemide for the oedema with no benefit.

Investigations reveal the following:

| | | |
|---|---|---|
| **Haemoglobin** | 10.8 g/dl | (13.5-17.7) |
| **Creatinine** | 95 umol/L | (50-100) |
| **ESR** | 105 mm/hr | (0-10) |
| **CRP** | 64 mg/dl | (<5) |
| **Thyroid function tests** | Normal | |
| **Albumin** | 35 g/L | (34-48) |
| **Total Protein** | 80 g/L | (65-80) |
| **Rheumatoid Factor** | Negative | |
| **ANA** | Negative | |
| **Uric Acid** | 370 umol/L | (110-420) |

The most appropriate initial management of this patient is:

- ○ Prednisolone 10 mg per day
- ○ Prednisolone 10 mg per day and Methotrexate
- ○ Prednisolone 40 mg per day
- ○ Prednisolone 40 mg per day and Methotrexate
- ○ Prednisolone 60 mg per day

X ray Pelvis: normal sacroiliac joints

| | | |
|---|---|---|
| **ESR** | 90 | (<10mm/h) |
| **Hb** | 13.4 | (13-15g/dL) |
| **WBC** | 5.2 | (4-11x $10^9$ /L) |
| **PLT** | 320 | (150-400 x $10^9$ /L) |
| **MCV** | 84 | (80-100fL) |
| **Neutrophils** | 1.7 | (2-7.5 x $10^9$ /L) |
| **Lymphocytes** | 3.0 | (1.5-4.0 x $10^9$ /L) |
| **Eosinophils** | 0.1 | (0.04-0.4 x $10^9$ /L) |
| **Monocytes** | 0.4 | (0.2-0.8 x $10^9$ /L) |
| **Chest X Ray:** | normal. | |
| **Interferon Gamma Release Assay:** | Negative | |
| **Beta 2 microglobulin** | 1.5 | (1.5-2.1 g/mL) |
| **Lactate Dehydrogenase** | 240 | (240-280 U/L) |

Right Knee

| | |
|---|---|
| **Synovial Aspirate:** | Scanty small Gram negative organisms. |
| **Ziel Nielson Stain:** | Negative |

What is the most likely diagnosis?

- ○ Ankylosing Spondylitis
- ○ Brucellosis
- ○ Lymphoma
- ○ Psoriatic arthritis
- ○ Tuberculosis

Brucellosis is a zoonosis occurring after infection with any of the Brucella species, which include *B.mellitensis* (from sheep or goats), *B.abortus* (from cows), and *B.suis* (from pigs). Individuals at high risk of contracting the disease include farmers, veterinary surgeons, abbatoir workers and butchers.

The commonest species of Brucella to cause arthritis is *B.mellitensis*, and joint symptoms are seen in 80% of infections. These manifest mostly as spondylitis, and sacroiliitis in adults, and also arthralgia and peripheral arthritis. Axial involvement may be complicated by paraspinal abscess formation, myelopathy and radiculopathy.

Splenomegaly is seen in 25% of cases. Hepatomegaly and lymphadenopathy may also be seen. Brucella species are Gram negative organisms which mostly infect phagocytic mononuclear cells. The erythrocyte sedmientation rate is raised in most cases, and full blood count may reveal neutropenia and relative lymphocytosis in half of cases. There is no consensus on antimicrobial agents, but the World Health Organisation recommends rifampicin and doxycycline treatment for at least 6 weeks.

This lady's negative Interferon Gamma Release Assay, previous BCG vaccination and normal chest X ray makes tuberculosis less likely. As a butcher she may be at risk of exposure to bovine tuberculosis, but the presence of Gram negative, Ziel Nielsson stain negative organisms on her synovial fluid analysis should be more suggestive of Brucellosis amongst the possible diagnoses listed. Fevers and night sweats are not a feature of ankylosing spondylitis or psoriatic arthritis and should suggest an alternative diagnosis. Lymphoma is less likely given the normal LDH and beta 2 microglobulin levels.

Allopurinol dose increase 8%

Febuxostat ✔ Correct answer 70%

selected

Long term colchicine 8%

Probenecid 13%

Sulphinpyrazone 4%

There is no dose adjustment required for febuxostat in mild- moderate renal impairment. It is relatively contraindicated in ischaemic heart disease and heart failure which this patient doesn't have. Allopurinol cant be increased due to very poor renal function.

Sulphinpyrazone and probenecid are not safe in renal impairment but benzbromarone is, though it is not one of the options given.

The BSR (British Society for Rheumatology ) permits colchicine to be given for a maximum of 6 months at 0.5 mg bd from the initiation of uricosuric therapy.

Question ID #3472

A 43 year old butcher is referred to you by her GP with malaise, worsening back pain and stiffness over the past 8 weeks. Every 2-3 days she has had undulating fevers, rigors and sweats at night. She received the BCG vaccination as an adolescent, and has never travelled to any areas endemic with tuberculosis. She denies sexual contact with anyone other than her husband, and has never used recreational drugs. She lives with her husband and two sons, who are all well.

Clinical examination reveals sacroiliac tenderness on the right on flexion and crossed adduction of the right hip. There is no tenderness of the left sacroiliac joint.

Her cervical lymph nodes are slightly enlarged but not tender.

Abdominal examination reveals splenomegaly.

Lumbar spine X ray: Narrowed disc space at L3/L4 disc.
L4 vertebral end plate destruction and bony sclerosis.

X ray Pelvis: normal sacroiliac joints

| | | |
|---|---|---|
| **ESR** | 90 | (<10mm/h) |

A 54 year old gentleman with renal impairment develops a third attack of gouty arthritis this year. He has been taking allopurinol for 2 years and at 300mg daily dosage for 9 months. He denies alcohol intake. There is a history of renal calculi previously with no identifiable cause and he has had removal of tophus from his left first metatarsophalangeal joint 3 years ago. There is no history of heart failure or diuretic use, but he is taking Losartan for hypertension.

Investigations:

| | | |
|---|---|---|
| **CRP** | 21 mg/L | (Normal < 10 mg/L) |
| **Uric acid** | 0.45 mmol/L | (Normal < 0.4 mmol/L) |
| **Urea** | 19 mmol/L | (Normal < 8.0 mmol/L) |
| **Creatinine** | 210 µmol/L | (Normal < 110 µmol/L) |
| **eGFR** | 35 ml/min | (Mild <90, Mod <60, severe < 30) |
| **Glucose** | 4.7 mmol/L | (Normal 3.5 - 5.0 mmol/L) |

Which treatment is most appropriate?

- ○ Allopurinol dose increase
- ○ Febuxostat
- ○ Long term colchicine
- ○ Probenecid
- ○ Sulphinpyrazone

A 25 year old Romanian man who has just returned from a holiday to Romania, presents with a swollen right knee. He is otherwise well with no constitutional symptoms and no other joint symptoms.

The knee is aspirated and sent for microscopy and culture. The results are as follows;

| | |
|---|---|
| **Leucocytes** | 100,000 |
| **No growth** | |

What is the most likely diagnosis?

- ○ Ankylosing spondylitis
- ○ Reactive arthritis
- ○ Rheumatoid arthritis
- ○ Septic arthritis
- ○ Tuberculosis

| | Colour | Clarity | Viscosity | WBC count ($mm^3$) | Neutrophil count | Gram stain | Crystals |
|---|---|---|---|---|---|---|---|
| **Normal** | Colourless | Translucent | ↑ | < 200 cells/$mm^3$ | <25 % | Negative | Negative |
| **Non-inflammatory** | Straw like / yellow | Translucent | ↑ | 200 - 2000 cells/$mm^3$ | <25 % | Negative | Negative |
| **Inflammatory** | Yellow | Cloudy | ↓ | 2000–50,000 cells/$mm^3$ | >50 % | Negative | Positive |
| **Septic** | Yellow/green | Cloudy / opaque | ↓ | >50,000 cells/$mm^3$ | >75 % | Positive | Negative |
| **Haemarthrosis** | Red/ xanthochromic | Bloody | Variable | 200-2000 $mm^3$ | 50-75 % | Negative | Negative |

# Synovial Fluid Analyses, Synovial Biopsy and Synovial Pathology

| | Appearance | Viscosity | Cells per mm³ | % PMNs | Crystals | Culture |
|---|---|---|---|---|---|---|
| Normal | Transparent | High | <200 | <10% | Negative | Negative |
| Osteoarthritis | Transparent | High | 200-2000 | <10% | Occasional calcium pyrophospate and hydroxyapatite crystals | Negative |
| Rheumatoid arthritis | Translucent | Low | 2000-50,000 | Variable | Negative | Negative |
| Psoriatic arthritis | Translucent | Low | 2000-50,000 | Variable | Negative | Negative |
| Reactive arthritis | Translucent | Low | 2000-50,000 | Variable | Negative | Negative |
| Gout | Translucent to cloudy | Low | 200->50,000 | >90% | Needle-shaped, negatively birefringent monosodium urate monohydrate crystals | Negative |
| Pseudogout | Translucent to cloudy | Low | 200-50,000 | >90% | Rhomboid, positively birefringent calcium pyrophosphate crystals | Negative |
| Bacterial arthritis | Cloudy | Variable | 2000->50,000 | >90% | Negative | Positive |
| PVNS | Hemorrhagic or brown | Low | — | — | Negative | Negative |
| Hemarthrosis | Hemorrhagic | Low | — | — | Negative | Negative |

PMNs, polymorphonuclear neutrophils; PVNS, pigmented villonodular synovitis.

Reactive arthritis ← Correct answer — 60%

Rheumatoid arthritis — 0%

Septic arthritis ✖ Incorrect answer selected — 28%

Tuberculosis — 12%

This is most likely to be a reactive arthritis. A leucocyte count >50,000 means the effusion is likely to be inflammatory, but without other joint symptoms it is unlikely to be ankylosing spondylitis or rheumatoid arthritis. And without constitutional symptoms septic arthritis or TB are less likely. You would also expect a positive culture results as yields from synovial fluid are 85% and 80% respectively.

Reactive arthritis most commonly occurs after an enteric or urogenital infection. Chlamydia is the most common urogenital infection which causes reactive arthritis and is commonly asymptomatic. Enteric infections such as Shigella, Salmonella, and Yersinia are all associated with reactive arthritis. All are gram negative. Infections are more likely to cause reactive arthritis in HLA B27 positive individuals. The mean age of onset is 25-35 years. It commonly causes a lower limb mono- or oligoarthritis but may cause inflammatory back pain or dactylitis. Enthesitis may also occur. There is an association with keratoderma and pustulosis on the palms and soles, uveitis and conjunctivitis and, with urogenital infection, balanitis. ESR and CRP are raised but rheumatoid factor and ANA are negative.

Most will settle within 3-5 months and may be treated with analgesia and NSAIDs alone. 15% will be more aggressive and persistent and may require glucocorticoids initially and sometimes sulphasalazine, for which there is RCT evidence, or methotrexate, for which there is no RCT evidence. Antibiotics may be used if the causative organism is identified.

Ufone 9:09 AM 64%
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| | | |
|---|---|---|
| | Fibromyalgia | 17% |
| | Hypothyroidism ← Correct answer | 41% |
| ○ | Myasthenia gravis | 1% |
| | Polymyalgia rheumatica | 27% |
| | Polymyositis ✖ Incorrect answer selected | 14% |

This patient has a lot of non specific symptoms which suggest a diagnosis of hypothyroidism. The myalgia, fatigue, a raised BMI that suggests weight gain, and mild proximal myopathy. The raised MCV, and hypertriglyceridaemia are associated features including mildly raised CK, AST, LDH due to abnormal muscle membranes.

Increased total and LDL cholesterol plus triglycerides may be seen due to reduced thyroid hormone metabolic clearance. Insulin resistance also occurs and raised plasma glucose/ abnormal glucose tolerance can be seen.

It is unlikely that such a mild CK rise would be associated with inflammatory myositis and fibromyalgia would not fit with the abnormal investigation pattern seen.

A 50 year old housewife presents with a 3 month history of myalgia, fatigue, and 'aching all over'. She is a non- smoker and not taking any medications. On examination her BMI is 31 $kg/m^2$ and she has some weakness in shoulder abduction bilaterally with some difficulty in rising from a chair.

Investigations:

| | | |
|---|---|---|
| **Haemoglobin** | 12.9 g/dL | (13 - 18 g/dL) |
| **WBC** | 6.4 $x10^9/L$ | (4 -11 $x10^9/L$) |
| **Platelets** | 389 $x10^9/L$ | (150 - 400 $x10^9/L$) |
| **MCV** | 103 fl | (80-100 fl) |
| **ESR** | 10 mm/hr | (<40 mm/hr) |
| **CK** | 248 iU/L | (<200 iU/L) |
| **Bilirubin** | 10 iU/L | (3-17 iU/L) |
| **ALP** | 190 iU/L | (<300 iU/L) |
| **AST** | 46 iU/L | (3-35 iU/L) |
| **ALT** | 35 iU/L | (3-35 iU/L) |
| **LDH** | 300 iU/L | (70-250 iU/L) |
| **Total Cholesterol** | 6.1 iU/L | (<5 iU/L) |
| **Triglycerides** | 3.4 iU/L | (<1.9 iU/L) |

What is the most likely diagnosis?

- ○ Fibromyalgia
- ○ Hypothyroidism
- ○ Myasthenia gravis
- ○ Polymyalgia rheumatica
- ○ Polymyositis

A 51 year old lady presents with a septic right knee joint. Joint aspiration is sent for culture and Streptococcus bovis is confirmed. She is treated with intravenous antibiotics for 2 weeks and a further 4 weeks of oral antimicrobial therapy.

Which investigation should be carried out next?

- Arthroscopy
- Chest X Ray
- Colonoscopy
- Lumbar spine X rays
- Synovial biopsy

Arthroscopy 8%

Chest X Ray 2%

Colonoscopy ✔ Correct answer 84%

selected

Lumbar spine X rays 3%

Synovial biopsy 3%

Steptococcus bovis is an organism that is associated with colonic malignancy. Genomic reassociations have shown that S. bovis biotype 1 is associated with malignancy in 100% of cases and biotype 2 only in 25%. In this case S. bovis has seeded into the joint to produce a septic arthritis. As it is uncommon to isolate S. bovis in a joint, further follow up with colonoscopy is advised.

Commence Benzbromarone ✔ 38%

Correct answer selected

Commence long term low dose colchicine. 9%

Commence long term oral steroids 14%

Commence Probenecid 32%

Commence Sulphinpyrazone 7%

Recent guidance from the British Society of Rheumatology suggests that if a patient's gout is not adequately controlled on allopurinol and they have renal impairment then they should be switched to Benzbromarone. This drug needs to be carefully monitored as it is associated with liver function abnormalities.

An 58 year old man with longstanding gout is admitted with a further flare in his left knee which is effectively treated with aspiration and steroid injection. He only has one kidney as he is a kidney donor. He has had 3 attacks of gout in the last 4 months despite taking 600mg per day of allopurinol. He uses colchicine for acute attacks and takes Atenolol 50mg per day for hypertension. Recent investigations reveal the following:

| | | |
|---|---|---|
| **Creatinine** | 140 umol/L | (50-100) |
| **Uric Acid** | 520 umol/L | (110-420) |

Which of the following alternatives to allopurinol is the recommended next step in management?

- ○ Commence Benzbromarone
- ○ Commence long term low dose colchicine.
- ○ Commence long term oral steroids
- ○ Commence Probenecid
- ○ Commence Sulphinpyrazone

An 82 year old woman presents with intermittent pain and swelling of the wrists, metacarpophalangeal joints and proximal interphalangeal joints for a year. She also has an olecranon bursitis. In the past she has had bilateral knee replacements. On examination she has a warm swollen left wrist and Heberden's and Bouchard's nodes. She is hypertensive and has moderate renal impairment with a creatinine of 161 (normal range 79-118 micromol/L).

What would you do next?

- ○ Aspirate and send fluid for crystals and MC&S
- ○ Request anti-CCP
- ○ Request bloods cultures
- ○ Request serum urate
- ○ X-ray her hands

Ufone 12:50 AM 87%
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Peer responses

| | |
|---|---|
| Aspirate and send fluid for crystals and MC&S ✔ Correct answer selected | 48% |
| Request anti-CCP | 17% |
| Request bloods cultures | 0% |
| Request serum urate | 4% |
| X-ray her hands | 31% |

The most likely diagnosis in this case is pseudogout presenting with a pseudorheumatoid pattern of chronic, recurrent swelling affecting primarily large joints. It is often associated with inflammatory symptoms such as stiffness, pyrexia, and malaise. A monoarticular presentation is typical.

However any patient presenting with a warm swollen joint must have the joint aspirated and sent for urgent gram stain, culture and microscopy to exclude a septic arthritis. It is likely the microscopy will provide the diagnosis by showing brick shaped, weakly positively birefringent crystals but it should be remembered that crystals may still be seen in a septic joint.

Reference:

Gram negative diplococci ✔ 83%

Correct answer selected

Gram negative rods 4%

Gram positive bacilli 1%

Gram positive cocci 1%

Gram positive diplococci 11%

Neisseria gonorrhoeae is a gram negative diplococci. It is sexually transmitted and most commonly affects young people with current rates highest in males aged 20-24 years and females aged 16-19 years. Only 25 % of men report genital infection (burning dysuria and discharge). Cervicitis is frequently asymptomatic. The associated arthritis is more commonly seen in women (1:3) as are the other disseminated features (endocarditis, myocarditis, pericarditis, conduction abnormalities, hepatitis and meningitis).

aortic root dilatation. In this case the dyspnoea is secondary to cardiac failure caused by aortic regurgitation.

Congenital syphilis can also cause collapse of the nasal bridge and aortitis but symptoms appear earlier in life typically as structures are developing.

Wegener's granulomatosis is unlikely as the ANCA is negative.

Three forms of leishmaniasis have been described but only cutaneous leishmaniasis of the new world (American cutaneous leishmaniasis), caused by L.Braziliensis, is associated with involvement of the nasal cartilages. Leprosy can also involve the nasal cartilages.

Cocaine abuse tends to cause destruction of the nasal septum. It can cause cardiac failure but associated with arrythmias rather than valvular disease.

Reference:


- Eular Compendium on rheumatic diseases. BMJ publishing 2009. p364
- Kumar and Clark.Clinical medicine 7th edition. Saunders limited 2009.

A 24 year old girl is referred to you by her GP. She has had a flitting arthralgia and an Achilles tendonitis for 6 weeks and has now developed a swollen left knee. She also had a maculo-papular rash across her trunk although it is now healing. She has felt lethargic and has been pyrexial. On examination her knee is very swollen and warm. There is a fixed flexion deformity and active and passive flexion is significantly limited. There is mild swelling of the Achilles tendon.

Aspiration of the knee is performed and microscopy and culture reveal Neisseria gonorrhoeae infection.

On microscopy the organisms seen would be?

- ○ Gram negative diplococci
- ○ Gram negative rods
- ○ Gram positive bacilli
- ○ Gram positive cocci
- ○ Gram positive diplococci

| | | |
|---|---|---|
| ○ | Leishmaniasis | 1% |
| ○ | Relapsing polychondritis ✔ | 38% |
| | Correct answer selected | |
| ○ | Wegener's granulomatosis | 26% |

Relapsing polychondritis is an autoimmune or autoinflammatory condition where recurrent inflammation of the cartilage is the key finding. After auricular inflammation involvement of the nasal cartilage is the most common cartilaagenous finding and can lead to collapse of the bridge.

It can be primary or secondary and associated with many of the systemic vasculitides, including Behcet's syndrome or polyarteritis nodosa, rheumatoid arthritis, SLE, Sjogren's syndrome, myelodysplastic syndromes and haematological malignancy as well as many other conditions.

Although it is frequently a mild condition it can be severe and life threatening with laryngotracheal involvement, renal involvement with mesangial disease and IgA nephropathy or aortitis leading to

A 42 year old caucasian woman with no past medical history of note, no current medication, no family history or history of foreign travel, presents to A&E with dyspnoea. On examination she is dyspnoeic at rest, there are bibasal crackles and she has a loud diastolic murmur heard best at the sternal edge. Her pulse is 106 bpm regular but collapsing in nature. She also has a collapsed nasal bridge. She is ANA, ENA and ANCA negative.

Which of the following is most likely to be the cause?

- Cocaine use
- Congenital Syphilis
- Leishmaniasis
- Relapsing polychondritis
- Wegener's granulomatosis

| | | |
|---|---|---|
| | Athlete associated costochondritis | 13% |
| | Infective costochondritis ← Correct answer | 46% |
| | SAPHO syndrome ✖ Incorrect answer selected | 25% |
| | Sarcoma | 0% |
| | Tietzes | 16% |

Infective costochondritis is most commonly seen in patients with pre-disposing factors to infection such as diabetes mellitus, rheumatoid arthritis and long term haemodialysis[1]. Although Tietzes' syndrome would cause the swelling and tenderness, it is not associated with fever or leucocytosis. Although this man has acne and costochondritis he has no other features of the SAPHO (synovitis, acne, pustulosis, hyperostosis and osteomyelitis) syndrome, his facial acne is not likely to be significant as it is reasonably common in young men. Given the rapid onset sarcoma is highly unlikely. Costochondritis is also commonly seen in athletes in particular rowers, although this is not usually associated with swelling, fever or leucocytosis

A 22 year old man with type 1 diabetes is seen on the acute medical ward with a one week history of chest pain and localised chest wall swelling. He is a keen rower and has recently increased his training regime. His diabetes is controlled with subcutaneous insulin although he admits his control is difficult due to his training regime. His only current medication is topical benzoyl peroxide for facial acne.

His temperature is 38.2°C and examination of the chest demonstrates tender swelling over the left third and fourth costochondral cartilages. Investigations reveal:

| | |
|---|---|
| **CRP** | 42 mg/dl (<5) |
| **WBC** | $19x10^9$/l (4-11) |
| **Neutrophils** | $15x10^9$/l (2.0-7.5) |
| **Haemoglobin** | 15 g/dl (13.5-17.7) |

Which of the following is the most likely diagnosis?

- ○ Athlete associated costochondritis
- ○ Infective costochondritis
- ○ SAPHO syndrome
- ○ Sarcoma
- ○ Tietzes

Ufone 12:08 AM 94%
studyprn.com

| | | |
|---|---|---|
| | Regular colchicine ✔ Correct answer selected | 45% |
| | Prednisolone | 16% |
| | Hydroxychloroquine | 8% |
| | Paracetamol | 1% |

Familial Mediterranean Fever (FMF) is one of several heritable autoinflammatory diseases. It is characterised clinically by attacks of persistent fever, serosal inflammation (peritonitis,pleuritis, scrotitis, pericarditis), arthralgia of large joints, and erythema of the lower limbs reminiscent of erysipelas. Most cases present before the age of 5 years. The length of attacks vary from a few hours to approximately 4 days. Inflammatory attacks may be triggered by stress, viral disease during infancy and drugs including metaraminol and cisplatin. The key complication of chronic FMF is AA amyloidosis, and if untreated leads to nephropathy.

As the name suggests, FMF affects patients of Mediterranean heritage, including Turkish, Armenian, Arab and Greek populations. Understanding of the disorder has advanced greatly since the advent of genomic analysis. The gene for FMF, is known as MEFV and is found on the short arm of chromososme 16. It is expressed in myeloid cells and encodes a protein known as marenotrin / pyrin. This protein interacts with other proteins including apoptotic speck protein (ASC) triggering the release of IL-1ß, via the mediators

nephropathy.

As the name suggests, FMF affects patients of Mediterranean heritage, including Turkish, Armenian, Arab and Greek populations. Understanding of the disorder has advanced greatly since the advent of genomic analysis. The gene for FMF, is known as MEFV and is found on the short arm of chromososme 16. It is expressed in myeloid cells and encodes a protein known as marenotrin / pyrin. This protein interacts with other proteins including apoptotic speck protein (ASC) triggering the release of IL-1ß, via the mediators Nuclear Factor Kappa B and pro-caspase-1. The inflammasome is a protein complex that associates cryopyrin with other proteins to activate pro-caspase-1 to generate IL-1ß. Colchicine, at doses of between 1 and 2.5mg taken daily helps to prevent attacks and reduce the risk of amyloidosis[1]. Response to daily colchicine treatment is generally good, and colchicine intoxication is rarely reported. IL-1 inhibition with agents such as anakinra or canakinumab show promising results in colchicine resistant cases.

The correct answer therefore is B, since colchicine taken as required will not protect against amyloidosis. Prednisolone in the long term will cause unacceptable side effects, and there is no evidence to support the use of either hydroxychloroquine or paracetamol in treating FMF.

Synovial biopsy ✔ Correct answer selected 12%

Synovial fluid Mycobacterial PCR 58%

Synovial fluid TB culture 12%

This lady is likely to have tuberculous arthritis of the knee. Around 80% of new cases of mycobacterium tuberculosis (MTB) occur in sub-Saharan Africa and Asia, but the infection is increasingly seen in Eastern Europe, particularly multi drug resistant forms of the mycobacterium[1]. Typically, MTB arthritis presents with chronic monoarthritis of the knee or hip, which account for 85% of cases. Other joints which are less frequently involved include shoulder, sacroiliac, elbow, ankle, and small joints of the hands and feet.

Synovial biopsy is most likely to confirm the diagnosis with a reported yield of 90% [1]. Synovial fluid microscopy has a sensitivity of 20-40%, and synovial fluid culture (which can take longer than 6 weeks) is 80% sensitive. MRI can demonstrate synovitis, pannus and erosion in the knee during the early stages of infection but would not confirm the diagnosis. Synovial fluid PCR for TB has a reported sensitivity of 73.9% [2] Blood cultures are often negative in tuberculosis.

Immunocompromise can cause a false negative tuberculin skin test. In such patients it is now possible to test for gamma interferon producing T cells, but the availability and sensitivity of these tests (e.g. Quantiferon, T-Spot) are variable.

References:

A 25 year old Armenian man is seen in outpatients clinic for follow up. He presented with a several year history of intermittent fevers, sharp central chest and abdominal pains. During attacks he complains of pain in his knees and ankles as well as a red rash on his legs.

Investigations for lymphoma and tuberculosis return normal. Serial blood cultures and serum viral PCR analysis was negative. Genetic tests confirmed the presence of the MEFV (Mediterranean Fever) gene. You explain the results of the genetic tests to your patient. He has ongoing symptoms, and is now having difficulty continuing his work as a carpenter. He asks directly regarding treatment for his symptoms.

Which of the following treatment options is most appropriate?

- Colchicine as required during febrile attacks
- Regular colchicine
- Prednisolone
- Hydroxychloroquine
- Paracetamol

Other investigations show:

| | |
|---|---|
| **Haemoglobin** | 12.4 g/dL (13-15 g/dL) |
| **WBC** | 12.1 (4-11x $10^9$ /L) |
| **Platelets** | 320 (150-400 x $10^9$ /L) |
| **MCV** | 82 fL (80-100fL) |
| **Sodium** | 136 mmol/L (135-145 mmol/L) |
| **Potassium** | 4.4 mmol/L (3.5-5.0 mmol/L) |
| **Urea** | 6.4 mmol/L (2.5-7.0 mmol/L) |
| **Creatinine** | 98 micromol/L (70-110 micromol/L) |
| **Bilirubin** | 14 micromol/L (5-17 micromol/L) |
| **ALT** | 36 IU/L (5-40 IU/L) |
| **ALP** | 90 IU/L (30-110 IU/L) |
| **Albumin** | 40 g/L (35-50 g/L) |
| **Protein** | 78 g/L (60-80 g/L) |
| **Globulin** | 38 g/L (22-32 g/L) |
| **CRP** | 45 mg/L (<5 mg/L) |
| **ESR** | 48 mm/h (<10 mm/h) |

Which of the following investigations is most likely to yield the diagnosis?

- ○ Blood cultures
- ○ MRI Knee
- ○ Synovial biopsy
- ○ Synovial fluid Mycobacterial PCR
- ○ Synovial fluid TB culture

# Acute Medicine SCE Revision Musculoskeletal system

A 38 year old Russian lady attends A+E with pain in her right knee on a background of rheumatoid arthritis. Her disease has responded well to sulfasalazine since she was diagnosed 4 years ago. Today she complains of warmth, pain and swelling of the right knee, but is able to weight bear. Her knee has been troublesome for the past month and last week her GP started her on Prednisolone 7.5 mg. She has recently spent 3 months in Russia caring for her mother who is recovering from a stroke, and the patient returned to this country 3 weeks ago. Whilst in Russia she had an adequate supply of sulfasalazine, and was able to continue her blood monitoring with a local GP. She suffered a purulent cough for approximately 1 week whilst abroad, but resolved within 7 days. Her other joints remain quiescent. She has lost 1 stone in weight since her last clinic visit 6 months ago. Clinical examination revealed a large right knee effusion with the knee held in 5 degrees of fixed flexion. The knee was not particularly warm or tender. The small joints of her hands and feet were not swollen or tender.

You proceed to aspirate the joint, and 50 ml of turbid synovial fluid is withdrawn.

Results of joint aspiration reveals:

| | |
|---|---|
| **Synovial fluid Gram stain:** | no organisms seen |
| | numerous lymphocytes |
| | scanty polymorphs |
| **Synovial fluid Ziel-Nielsen stain:** | negative |
| **Tuberculin skin test** | negative |

Other investigations show:

2 Minute Medicine® **ABCD2 Score** 2minutemedicine.com

| Risk Factor | Points |
|---|---|
| **A**ge ≥60 years | 1 |
| **B**lood pressure elevation (systolic >140 mmHg and/or diastolic ≥90 mmHg) | 1 |
| *Clinical features* | |
| Unilateral weakness | 2 |
| Speech disturbance without weakness | 1 |
| *Duration of symptoms* | |
| ≥60 minutes | 2 |
| 10-59 minutes | 1 |
| **D**iabetes mellitus | 1 |

| ABCD2 Score | Patients | 2-day risk (%) | 7-day risk (%) | 90-day risk (%) |
|---|---|---|---|---|
| Low (0-3) | 1,628 | 1.0 | 1.2 | 3.1 |
| Moderate (4-5) | 2,169 | 4.1 | 5.9 | 9.8 |
| High (6-7) | 1,012 | 8.1 | 11.7 | 17.8 |

Table 1. The ABDC2 Score. | 2minutemedicine.com

Ufone 11:34 PM 99%
studyprn.com

7 ✔ Correct answer selected 42%

The ABCD2 score is a risk assessment tool designed to stratify TIAs according to future risk of stroke.

A refers to age >60 =1

B refers to blood pressure with either systolic or diastolic >140/90 = 1

C – Clinical Features: Unilateral weakness with or without speech impairment =2. Speech impairment =1

D – Duration: 10-59mins =1. >60 mins = 2

2 – Type 2 diabetes = 1

In our example, the age =1, blood pressure =1, Clinical features =2, duration =2 and he has diabetes =1

The score is therefore 7 which is the maximal score indicating a high risk of a completed stroke 2, 7, 30 and 90 days after a TIA. With an ABCD2 score of 6-7 there is an approximate 10% risk of stroke at 7 days and the recommendation in this case is one of admission with observation.

MRI Lumbar spine ✔ Correct answer selected 94%

Nerve conduction studies 3%

Xray lumbar spine 2%

This lady has the classic features of a cauda equina syndrome:

- Back pain
- Radicular pain/numbness down the legs
- Areflexic paralysis of the legs
- Sensory loss in a root distribution
- Reduced sphincter power

She has bilateral lower leg flaccid weakness with absent reflexes and sensory disturbance with loss of perianal sensation. Usually these lesions present at an earlier stage with conus medullaris lesions: urinary retention , constipation , back pain, sacral sensory loss, with or without leg weakness, & saddle anaesthesia. Previous cervical spondylosis and carpal tunnel syndrome release are just distractors and bear no clinical relevance to the current symptoms.

A 71 year old lady with a 10 year history of type 2 diabetes presents to accident and emergency with severe intermittent right sided abdominal pains. There is a long history of arthralgia over many years together with fatigue and Raynaud's phenomenon. Her only medications include Metformin 1g bd and furosemide 40mg for mild heart failure. Examination confirms a respiratory rate of 20 breaths per minute, pulse of 90 beats per minute, blood pressure of 110/78 mmHg and there is abdominal tenderness over the right flank.

Investigations:

| | | |
|---|---|---|
| **Rheumatoid factor** | 115 iU/L | (Normal < 15 iU/L) |
| **ANA** | 1: 2560 | (strongly positive > 1: 640) |
| **ENA** | strongly positive | |
| **SSA/ Ro** | 114 U/ml | (Normal < 20 U/ml) |
| **SSB/ La** | 64 U/ml | (Normal < 20 U/ml) |
| **ESR** | 78 mm/hr | ( Normal < 40 mm) |

| | | |
|---|---|---|
| | | U/ml) |
| **ESR** | 78 mm/hr | ( Normal < 40 mm) |
| **Glucose** | 7.0 mmol/L | (3.5 - 5.0 mmol/L) |
| **Urea** | 9.0 mmol/L | (< 8.0 mmol/l) |
| **Creatinine** | 70 µmol/L | (< 110 µmol/L) |
| **Sodium** | 135 mmol/L | (135-145 mmol/L) |
| **Potassium** | 3.0 mmol/L | (3.5 - 5.0 mmol/L) |
| **Chloride** | 99 mmol/L | (98-106 mmol/L) |
| **Bicarbonate** | 19 mmol/L | (24-30 mmol/L) |

Urine dipstick : Blood 3+, ph 5.8, glucose 1+

Chest X Ray- Clear

What is the most likely diagnosis?

- ○ Addisonian crisis
- ○ Diabetic ketoacidosis and cheiroarthropathy
- ○ Drug induced hypokalaemic acidosis
- ○ Sjogrens syndrome with distal renal tubular acidosis and nephrocalcinosis
- ○ Sjogrens syndrome/ Systemic lupus overlap

A 74 year old woman presents to clinic with a number of Leg ulcers. She has longstanding rheumatoid arthritis and had stopped her Methotrexate therapy over one year ago. Her weight has been stable. She is not keen on further therapy but is frustrated that she has had 6 months of troublesome leg ulcers. Abdominal examination reveals an 8cm mass in the left upper quadrant that is dull to percuss and descends on inspiration.

Her investigations are below:

| | | |
|---|---|---|
| **Haemoglobin** | 10.9 g/dL | (13 - 18 g/dL) |
| **WBC** | 2.4 x$10^9$/L | (4 -11 x$10^9$/L) |
| **Neutrophils** | 0.7 x$10^9$/L | (>2 x$10^9$/L) |
| **Lymphocytes** | 1.5 x$10^9$/L | (>1 x$10^9$/L) |
| **Platelets** | 85 x$10^9$/L | (150 - 400 x$10^9$/L) |

What is the most likely explanation for her symptoms?

- ○ Chronic lymphocytic leukaemia
- ○ Felty's syndrome
- ○ Methotrexate induced pancytopenia
- ○ Myelofibrosis
- ○ Occult Malignancy

A 78 year old man with gout, hypertension and renal impairment is admitted to the acute medical ward with increasing proximal muscle weakness over the last 4 weeks. His current medication is allopurinol 200mg per day, colchicine 500 mcg twice daily, atenolol 50mg and enalapril 10mg. Examination reveals MRC grade 4/5 power in the proximal muscle groups of both upper and lower limbs and small gouty tophi on both elbows.

Investigations reveal the following:

| | |
|---|---|
| **Creatinine** | 135 umol/L (50-100) |
| **Creatine Kinase(CK)** | 982 U/L (24-195) |
| **CRP** | 6 mg/dl (<5) |
| **ANA** | Negative |
| **Anti-Jo1** | Negative |
| **ESR** | 28 mm/hr (0-10) |

EMGs - Myopathic changes of proximal muscle groups

What is the most likely diagnosis?

- ○ Anti-synthetase syndrome
- ○ Colchicine induced myopathy
- ○ Guillain-Barré syndrome
- ○ Inclusion body myositis
- ○ Polymyositis

Chronic lymphocytic leukaemia

Felty's syndrome ✔ Correct answer selected 88%

Methotrexate induced pancytopenia 2%

Myelofibrosis 8%

Occult Malignancy 1%

This long standing patient with rheumatoid arthritis has the triad of Neutropenia, Splenomegaly and leg ulcers. This is Felty's syndrome. Patients may also have other haematological findings including thrombocytopenia, anaemia and pancytopenia. Methotrexate induced pancytopenia would not occur a year after stopping therapy.

Felty's syndrome ties in all the features of this presentation, and the other diagnoses would not account for all these features.

References:

Oxford desk reference in Rheumatology, Watts et

| | | |
|---|---|---|
| **IgG** | 5.4 mg/l | (5.5-16.5) |
| **IgA** | 3.2 mg/l | (0.8-4.0) |
| **IgM** | 1.2 mg/l | (0.4-2.0) |
| **Rheumatoid Factor** | 25 iu/l | (<20) |
| **ANA** | 1:1600 (positive) | |
| **ENA** | negative | |
| **ANCA** | negative | |

ECG; concave upward ST elevation in V2-6.

Chest x-ray; normal cardiac outline with small pleural effusion at left base.

Echocardiography; Small pericardial effusion. No evidence of tamponade.

What is the most likely diagnosis?

- ○ Rheumatoid arthritis
- ○ Sjogren's syndrome
- ○ Systemic lupus erythematosis
- ○ Takayasu's arteritis
- ○ Wegener's granulomatosis

A 28 year old female who is a solicitor presents with chest pain which is worse on inspiration and on lying flat. She has suffered with fatigue and arthralgia for some time. She has frequent mouth ulcers and suffers with a dry mouth. Recently she has had discomfort swallowing.

On examination she is mildly tachycardic and has an audible rub at the left lower sternal edge. Her hands are puffy and there is discolouration of the fingers. The joints of the hands are tender.

Investigations are as follows:

| | | |
|---|---|---|
| **CRP** | 88 mg/dl | (<10) |
| **ESR** | 102 mm/hr | (0-10) |
| **Hb** | 10.8 g/dl | (11.5-16.5) |
| **WCC** | $3.2x10^9$/l | (4-11) |
| **Neutrophils** | $2.1x10^9$/l | (2.0-7.5) |
| **Lymphocytes** | $0.6x10^9$/l | ( 1.5-4.0) |
| **Platelets** | $102x10^9$/l | (150-400) |
| **IgG** | 5.4 mg/l | (5.5-16.5) |
| **IgA** | 3.2 mg/l | (0.8-4.0) |

| | | |
|---|---|---|
| **Platelets** | 440 x$10^9$/l | (150-400 x$10^9$/l) |
| **ESR** | 90 mm/hr | (0-10 mm/hr) |
| **CRP** | 158 mg/dl | (<5 mg/dl) |
| **Creatinine** | 132?mol/l | (79-110?mol/l) |
| **Urea** | 7.5 mmol/l | (2.5-6.7 mmol/l) |
| **ALT** | 26 u/l | (5-40 u/l) |
| **ALP** | 134 u/l | (39-117 u/l) |

Which of the following investigations would you initially request?

- ○ Aspirate joint and send for AFB
- ○ Aspirate joint and send for crystal analysis
- ○ Aspirate joint and send for gram-stain, microscopy and culture
- ○ Chest x-ray
- ○ Mantoux test

| | | |
|---|---|---|
| ○ | Rheumatoid arthritis | 8% |
| ○ | Sjogren's syndrome | 20% |
| ○ | Systemic lupus erythematosis<br>✔ Correct answer selected | 70% |
| ○ | Takayasu's arteritis | 2% |
| ○ | Wegener's granulomatosis | 0% |

Pericarditis may occur in many rheumatological conditions but most commonly in SLE, rheumatoid arthritis and systemic sclerosis. It is not usually seen in ANCA positive or large vessel vasculitis. It may be the presenting symptom in SLE but tends to present later in rheumatoid and without the typical ECG findings (including diffuse concave upward, saddle shaped, ST elevation, except in aVR and V1 where it is usually depressed. T waves are upright in the leads with ST elevation, and the PR segment deviates opposite to P-wave polarity).

Echocardiography is the imaging modality of choice as it is widely available at the bedside. Patients should be seen by a cardiologist. NSAIDs are often useful for analgesia. Glucocorticoids are also helpful both for pericarditis symptoms and to treat the underlying disease. For recurrent and large effusions fenestration or resection of the pericardium may be required.

The CRP is usually normal in SLE except when there is co-existant serositis or infection.

| | | |
|---|---|---|
| **Platelets** | 102x$10^9$/l | (150-400) |
| **IgG** | 5.4 mg/l | (5.5-16.5) |
| **IgA** | 3.2 mg/l | (0.8-4.0) |
| **IgM** | 1.2 mg/l | (0.4-2.0) |
| **Rheumatoid Factor** | 25 iu/l | (<20) |
| **ANA** | 1:1600 (positive) | |
| **ENA** | negative | |
| **ANCA** | negative | |

ECG; concave upward ST elevation in V2-6.

Chest x-ray; normal cardiac outline with small pleural effusion at left base.

Echocardiography; Small pericardial effusion. No evidence of tamponade.

What is the most likely diagnosis?

- ○ Rheumatoid arthritis
- ○ Sjogren's syndrome
- ○ Systemic lupus erythematosis
- ○ Takayasu's arteritis
- ○ Wegener's granulomatosis

- [x] Aspirate joint and send for gram-stain, microscopy and culture ✔ Correct answer selected — 66%
- [ ] Chest x-ray — 4%
- [ ] Mantoux test — 1%

Treatment by instillation of an attenuated mycobacterium bovis into the bladder is common in superficial transitional cell bladder cancers. Following this a non-infectious polyarthritis may occur in 0.5-1% of patients. Knees are most commonly affected followed by ankles and wrists. Oligo and monoarthritis can also occur. Rarely sacroilitis, dactylitis, conjunctivitis, and uveitis can occur. Joint aspirates do not grow mycobacterium. The exact mechanism is unclear but it is thought that it is a T-cell mediated immune response to repeated antigen stimulation. It tends to occur after several instillations (mean 5). Pyrexia occurs in 2/3 of patients and most will mount raised inflammatory markers. Most are NSAID responsive but if there is no improvement rifampicin and isoniazid treatment may be effective. Infectious arthritis occurs much less frequently. A recent review found 8 cases, 1 had a monoarthritis of the knee; 2 had infection of a joint prosthesis, knee, and hip, respectively; and 5 had discitis. Infection of other organs (lungs, liver, and urinary tract) is more common. Joint infection tends to present and be diagnosed later than non-infectious cases, 8 months vs. 9 days on average. Patients also tend to be more systemically unwell.

You are asked to see a 72 year old man on the urology ward who has developed a polyarthritis affecting his right knee, ankles, and wrists. He had his 3rd treatment with intravesical BCG chemotherapy for a transitional cell carcinoma of the bladder 5 days earlier.

On examination, his temperature is 38.1°C, he has a warm effusion at his right knee with movement limited to 40 degrees of flexion, he is unable to fully extend His ankles and wrists are tender but not swollen and movement is normal. He has no lymphadenopathy and the rest of his examination is unremarkable.

Investigations reveal:

| | | |
|---|---|---|
| **Hb** | 11.2 g/dl | (13.5-17.7g/dl) |
| **WBC** | 14.1 x$10^9$/l | (4-11 x$10^9$/l) |
| **Neutrophils** | 8.4 x$10^9$/l | (2.0-7.5 x$10^9$/l) |
| **Lymphoctytes** | 5.2 x$10^9$/l | (1.5-4.0 x$10^9$/l) |
| **Platelets** | 440 x$10^9$/l | (150-400 x$10^9$/l) |
| **ESR** | 90 mm/hr | (0-10 mm/hr) |
| **CRP** | 158 mg/dl | (<5 mg/dl) |
| **Creatinine** | 132?mol/l | (79-110?mol/l) |

A CT brain demonstrates a hypointensity in the high frontal region in keeping with an acute ischemic stroke. There is no intracranial haemorrhage. A CT angiogram (from the aortic arch) found a narrowed eccentric lumen of the right ICA with a crescent-shaped mural thrombus, findings consistent with a right internal carotid artery dissection. There is no evidence of intra- or extracranial aneurysms.

What is the most appropriate management for this patient?

- ○ Antiplatelets or anticoagulation for 3-6 months
- ○ Lifelong antiplatelets (aspirin 300mg for two weeks followed by clopidogrel 75 mg)
- ○ Thrombolysis treatment as per local protocol
- ○ Urgent carotid endarterectomy
- ○ Urgent stenting of right internal carotid artery

| | |
|---|---|
| Diabetes and endocrine medicine | 29 |
| Gastroenterology and hepatology | 49 |
| Infectious diseases | 22 |
| Medicine in the elderly | 16 |
| Musculoskeletal system | 29 |
| Neurology and ophthalmology | 39 |
| Renal medicine | 19 |
| Respiratory medicine | 28 |
| Other | 23 |
| **Total:** | **285** |

Ufone 5:36 PM 50%
studyprn.com

Antiplatelets or anticoagulation for 3-6 months ✔ Correct answer selected 23%

Lifelong antiplatelets (aspirin 300mg for two weeks followed by clopidogrel 75 mg) 23%

Thrombolysis treatment as per local protocol 4%

Urgent carotid endarterectomy 16%

Urgent stenting of right internal carotid artery 35%

The CADISS trial published in 2015 found no difference in efficacy between antiplatelet and anticoagulant drugs at preventing stroke and death in patients with symptomatic carotid and vertebral artery dissection. The treatment duration is usually for 3-6 months with vascular imaging to monitor resolution of the dissection. Vascular interventions are usually reserved for patients with recurrent symptoms.

- The CADISS trial investigators, 2015

A 67 year old woman was admitted with a 3 day history of diplopia and clumsiness. She had been feeling unwell a week previously with a fever and flu-like illness and the symptoms of double vision and difficulty walking had developed over the last 3 days. She had a background history of hypothyroidism for which she took thyroxine and also had a 3 year history of type 2 diabetes for which she took metformin 1g bd.

On examination, she was orientated, had a temperature of 37C and a blood pressure of 142/82 mmHg with a pulse of 80bpm reg. She had weakness of abduction and adduction of the eyes with dilated and unreactive pupils together with bilateral facial weakness of the upper and lower face. There was also ataxia with difficulty standing upright and impaired finger to nose testing. Deep tendon reflexes were impaired though muscle strength was normal and there was no impairment of sensation.

Which of the following is the likely diagnosis?

- ○ Guillain-Barre Syndrome
- ○ Hashimoto's encephalopathy
- ○ Lyme Disease
- ○ Miller Fisher syndrome
- ○ Neurosarcoidosis

A 22 year old woman has been treated by the dental surgeons for a tooth extraction and receives ondansetron for nausea. You are called acutely as she has developed rhythmical and uncontrollable movements of the arms and legs. On review, you find that she is alert and cooperative but is anxious and upset. She usually takes mirtazapine for insomnia but is otherwise well. She is distressed by these uncontrollable movements of the limbs.

On examination, her temperature is 37.3C, her blood pressure is 138/80 mmHg and her pulse is 100 bpm. She has rhythmical writhing movements of the arms and legs to a lesser extent and some facial movements. Otherwise, reflexes are normal and there is no focal neurology.

Which of the following is the most appropriate treatment for this patient?

- Benztropine
- Chlordiazepoxide
- Chlorpromazine
- Clonazepam
- No treatment required

| | |
|---|---|
| Benztropine ✔ Correct answer selected | 59% |
| Chlordiazepoxide | 5% |
| Chlorpromazine | 11% |
| Clonazepam | 12% |
| No treatment required | 14% |

This patient has developed an acute dystonic reaction which is likely to have been precipitated by the ondansetron. Whilst acute dystonia is most often precipitated by dopamine antagonists such as metoclopramide and prochlorperazine, reports are associated with ondansetron. The differential diagnosis includes serotonin syndrome, but this is associated with high fever, anxiety, hyperreflexia and tachycardia. The treatment of serotonin syndrome is a dopamine antagonist, like chlorpromazine, but this may well make acute dystonia worse. Treatment depends on how problematic the symptoms are as they often resolve. In this case where the patient is distressed, the anticholinergic, benztropine IV would be the most appropriate treatment.

A 55-year-old man presents with a 1 day history of left sided facial weakness. 2 weeks previously he had been admitted to hospital under ENT with an otitis media requiring IV antibiotics. He had presented with severe left earache and fever. He had had a CT scan at this other centre which was reported as unremarkable. He had made a good recovery and was discharged after 3 days with a course of oral augmentin. He had made a good recovery, had been aware of some earache although this was much better than before. There was nothing else of note in his medical history.

On examination, he had a temperature of 37 C, a blood pressure of 132/80 mmHg and a pulse of 62 bpm. He had evidence of a left upper and lower facial muscle weakness but no other cranial nerve involvement was noted. Otherwise, balance was preserved and there were no cerebellar features. He had some cotton wool in his left ear and there was some reduction in hearing in this ear with an attempt to visualise the ear canal with an otoscope being unsuccessful as there appeared to be some fluid.

Which of the following is the most appropriate approach to the management of this patient?

- ○ Arrange further imaging of the head and ear canal
- ○ Commence gentamicin
- ○ Commence gentamicin with IV steroids
- ○ Treat with oral steroids and arrange OP review
- ○ Treat with oral steroids and oral acyclovir and arrange OP review

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A 48-year-old gentleman presents to the Emergency department with left sided weakness, blurred vision and neck pain for the last 2 days. The left sided weakness was of a sudden onset immediately preceded by right sided neck pain. Further history reveals that he had a minor car accident incurring a whiplash injury two weeks ago. Usually he is fit and well with no vascular risk factors. A family history is unremarkable.

Neurological examination shows a right sided ptosis with a right pupil 3 mm in diameter, and left pupil 5 mm in diameter. There were no other cranial nerve deficits. The left side was minimally weak (4/5); and there are no other neurological deficits. Body temperature is 36.4°C; RR 18; blood pressure 128/81; HR 78; oxygen saturation (room air) 98%.

Blood tests:

| Test | Result | Normal range |
|---|---|---|
| Wbc | $8.2\times 10^9$/L | 4.5 to 11.0 $\times 10^9$/L |
| CRP | 4 mg/L | <8 mg/L |

A CT brain demonstrates a hypointensity in the high frontal region in keeping with an acute ischemic stroke. There is no intracranial

| | |
|---|---|
| Guillain-Barre Syndrome | 10% |
| Hashimoto's encephalopathy | 9% |
| Lyme Disease | 2% |
| Miller Fisher syndrome ✔<br>Correct answer selected | 74% |
| Neurosarcoidosis | 5% |

This patient has a previous flu-like illness and has developed diplopia, facial weakness and ataxia. The diagnosis based on the history and examination is likely to be Miller Fisher syndrome a variant of Guillain Barre. Miller-Fisher is associated with the three features of: ataxia, ophthalmoplegia and loss of tendon reflexes. Diagnosis is based on the typical history and examination and is supported by acellular CSF with protein elevation.

**TABLE**

## Diagnostic significance of common immunofluorescent ANA patterns[3]

| ANA pattern | Specificity | Antigen | Disease association |
|---|---|---|---|
| Homogenous | Low | dsDNA | SLE |
| | | Histones | DLE, RA |
| Rim | High | Centromere | CREST, SLE |
| Speckled | Low | Ro/SS-A | SS |
| | | La/SS-B | SS |
| | | RNP | MCTD |
| | | Sm | SLE |
| | | Scl-70 | Scleroderma |
| Nucleolar | Low | PM/Scl | Scleroderma |
| Cytoplasmic | Low | tRNA synthetases, Jo-1 | Poly/dermatomyositis |
| | | Mitochondria | Primary biliary cirrhosis |
| | | Smooth muscle | Autoimmune hepatitis |

ANA, antinuclear antibody; CREST, calcinosis, Raynaud's phenomenon, esophageal dysmotility, sclerodactyly, and telangiectasia syndrome; DLE, discoid lupus erythematosus; dsDNA, double-stranded DNA; MCTD, mixed connective tissue disease; RA, rheumatoid arthritis; RNP, ribonucleoprotein; SLE, systemic lupus erythematosus; SS, Sjögren's syndrome; tRNA, transfer ribonucleic acid.

Sjogrens syndrome with distal renal tubular acidosis and nephrocalcinosis 71%

✔ Correct answer selected

Sjogrens syndrome/ Systemic lupus overlap 28%

This patient has symptoms and signs suggesting renal colic. Nephrocalcinosis is a recognised feature of hypercalciuria. The distal renal tubules are deficient in excreting H+ ions from the distal tubules. Hypokalaemia may also present as muscle weakness / hypokalaemic paralysis.

The anion gap is $(Na^+ + K^+)$- $(Cl^- + HCO^{3-})$ = (135 +3 ) - (99 +19)= 20 This explains the apparent breathessness - compensatory respiratory alkalosis in response to metabolic acidosis.

The positive RF , SSA/ Ro, SSB/ La are seen in Sjogrens and clinical symptoms may be longstanding prior to presentation. Marked polyclonal rise in IgG is also seen in active Sjogren's syndrome.

Metformin can cause lactic acidosis and furosemide may cause hypokalaemia but urine dipstick findings would not be compatible. One expects hyperkalaemia in an Addisonian crisis. There are no ketones in the urine dipstick therefore excluding diabetic ketoacidosis. Diabetic cheiroartropathy is more common in type 1 diabetics who complain of painless loss of function in the hands after swelling of MCP/PIPJs with development of thick tight waxy skin.

| | | |
|---|---|---|
| ○ | Anti-synthetase syndrome | 5% |
| ✓ | Colchicine induced myopathy | 49% |
| | Correct answer selected | |
| ○ | Guillain-Barré syndrome | 1% |
| ○ | Inclusion body myositis | 19% |
| ○ | Polymyositis | 26% |

Colchicine myopathy is characterized by proximal weakness and elevation of creatine kinase, proximal myopathic changes on electromyography and axonal polyneuropathy on nerve conduction studies. It is characteristically seen in patients with renal impairment but has rarely been described in patients with normal renal function. Muscle biopsy demonstrates vacuolar myopathy and would be the next investigation of choice in this patient. Treatment consists of drug withdrawal and it may take some months for muscle power to return and the CK to normalize.

- Arrange further imaging of the head and ear canal ← Correct answer — 40%
- Commence gentamicin — 2%
- Commence gentamicin with IV steroids — 10%
- Treat with oral steroids and arrange OP review ✖ Incorrect answer selected — 19%
- Treat with oral steroids and oral acyclovir and arrange OP review — 28%

**Explanation:**

This patient has a history of severe otitis media requiring admission and he has since developed a left isolated VII lower motor neurone palsy. Whilst Bell's palsy is a potential diagnosis, this cannot be purely attributed to Bell's, and one has to consider temporal bone erosion and dehiscence within the fallopian canal of the temporal bone within which the facial nerve resides. CT would probably provide the most appropriate imaging and the patient needs to be referred to ENT. Deterioration can result in Gradenigo's syndrome which is the involvement of the VIth cranial nerve and periorbital pain due to involvement of the Vth.

A 75 year old female was assessed in A&E having been brought into hospital by her husband in a confused state. They had been walking back from the shops and he stated that she started constantly asking where they were and what they had just been doing. This continued in the emergency department but by the evening post take ward round she was back to her normal self, although she couldn't recall the events of the day. The husband who was with her the whole time did not observe any limb weakness or facial asymmetry. Observations and bloods were unremarkable.

The most likely diagnosis is?

- First presentation of dementia
- Hypoglycemic event
- Temporal lobe epilepsy
- Transient ischaemic attack
- Transient global amnesia

A 55-year-old man presents with a one day history of weakness of the left side of his face and drooling. Other than a 2 year history of type 2 diabetes mellitus he has been well. He currently takes ramipril, simvastatin and metformin. He has recently commenced empagliflozin.

On examination, he had weakness of the lower and upper face and was unable to raise his eyebrows or purse his lips. There was no abnormality of the ear canal nor were there any other abnormalities of the cranial nerves. His blood pressure is 132/88 mmHg and his pulse is 88 bpm regular.

Investigations reveal:

| | |
|---|---|
| HbA1c | 62 mmol/mol (<48) |

Which of the following is most appropriate concerning the management of this patient?

- ○ Initially request CT of head
- ○ Request MRI of Cerebello-pontine angle
- ○ Stop empagliflozin
- ○ Switch metformin to insulin
- ○ Treat with oral steroids with OP review

| | | |
|---|---|---|
| **IgG** | | |
| **Anti Cardiolipin IgM** | 50 MPLU/ml | (<7) |
| **Factor V Leiden mutation:** | Not detected. | |
| **Protein C activity** | 118% | (76-208%) |
| **Protein S activity** | 111% | (62-153%) |
| **Anti thrombin III** | 0.9 kIU/L | (0.8-1.2 kIU/L) |
| **Homocysteine** | 5.5micromol/L | (4.9-11.6micromol/L) |

ECG: sinus rhythm, 80 beats per minute, normal axis, normal morphology.

Which of the following is the next most appropriate investigation?

- ○ Anti Beta 2 Glycoprotein 1 Antibodies
- ○ Carotid and vertebral artery Doppler scan
- ○ Echocardiography
- ○ Lower limb Venous Doppler
- ○ MRI Brain

A 24 year old lady is admitted under the acute medical team with sudden onset expressive dysphasia and right sided hemiplegia. She has suffered from migraine since the age of 16.

Clinical examination confirms increased tone in the right arm and leg. Power is graded 4/5 in all muscle groups of the right arm and leg and is 5/5 on the left. There is generalised hyper-reflexia and the right plantar is extensor. Sensation to light touch and vibration sense is preserved.

Investigations

CT Brain: Infarct in the left frontal lobe in the territory of the left middle cerebral artery.

| | | |
|---|---|---|
| **Anti dsDNA** | 5 U/L | (<20 U/L) |
| **ESR** | 32 mm/h | (0-10mm/h) |
| **CRP** | 39 mg/L | (<7mg/L) |
| **Lupus Anticoagulant** | Positive | |
| **Anti Cardiolipin IgG** | 45 GPLU/ml | (<10) |
| **Anti Cardiolipin** | 50 MPLU/ml | (<7) |

Doppler scan

Echocardiography ✔ Correct answer selected 25%

Lower limb Venous Doppler 4%

MRI Brain 16%

Antiphospholipid syndrome was first described by Hughes in 1983[1]. The most common cardiac manifestation of the disease is a non-bacterial thrombotic endocarditis[2], caused by platelet-fibrin thrombi forming on the endocardial surface of valves, with a prevalence of 11.6% reported[3]. An echocardiogram is an essential investigation for any patient presenting with a cerebral embolism to exclude an underlying cardiac cause such as mural thrombus, atrial myxoma, valvular vegetations, patent foramen ovale, and atrial or ventricular septal defects. Since her lupus anticoagulant and anti cardiolipin antibodies are both positive, testing for anti-beta2 glycoprotein1 antibodies would not provide any additional information at this stage. A repeat antiphospholipid screen in 12 weeks' time may be considered, but this is not relevant to this particular question. At her age she is unlikely to have significant atherosclerotic involvement of her carotid arteries to warrant a carotid arterial Doppler. If a paradoxical embolus was suspected, then an echocardiogram would be more urgently required than a venous Doppler scan of the leg. Her history does not suggest a cerebral vasculitis or encephalitis and therefore MRI would not take precedence over echocardiography in this case.

A 74 year old lady presents with a history of gradual weakness in her legs to an extent that she can no longer walk. She complains of back pains and numbness down both legs leading up to this presentation. There is no history of urinary or faecal incontinence. She has no significant past medical history except for previous carpal tunnel syndrome release and cervical spondylosis. On examination you find that there is full power in her upper limbs with intact reflexes and sensation. The legs are weak with absent knee and ankle jerks. There is loss of sensation to pinprick at the big toes of both feet, soles, and the back of both legs. There is perianal numbness and reduced sphincter tone.

What is the next appropriate investigation?

- Isotope bone scan
- MRI Cervical spine
- MRI Lumbar spine
- Nerve conduction studies
- Xray lumbar spine

vertigo

Cerebellar infarction ✔ Correct 31%

answer selected

Meniere's disease 3%

Migrainous vertigo 3%

Vestibular neuronitis 57%

The patient has risk factors for vascular disease, with poorly treated type two diabetes and evidence of hypertension. He has suffered previous ischaemic heart disease and a transient ischaemic attack indicating vascular disease.

He has features of central vertigo including gaze induced nystagmus and a wide based gait and is unable to mobilise without help.

The vertigo is of sudden onset and is severe.The above features point to a central cause of nystagmus and therefore require admission to secondary care for urgent investigation.

A 46 year old homeless man was admitted in a confused state. The manager of the hostel which he sometimes attended had been worried about him as he had become more confused and complained of headaches over the last 2 weeks and had been vomiting the last 2 days. He was known to abuse alcohol.

On examination, he was confused but had a GCS of 15 and had a temperature of 37.6C. Otherwise, neurological examination was unremarkable.

Relevant investigations:

CT head – mildly enlarged ventricles

Lumbar puncture revealed:

| | |
|---|---|
| Clear fluid | |
| Opening pressure | 30 cm/H20 (10 -20cm H20) |
| Total protein | 2.8 g/l (0.15-0.45) |
| Csf Glucose | 1.8 mmol(>3.3 mmol) |
| White cells | 52 and 100% lymphocytes (<5) |
| Plasma glucose at time of LP | 5.9mmol/l (3.5-5.5) |

Gram stain and AFB stain were both negative

The most likely diagnosis is:

- ○ Cryptococcal meningitis
- ○ Cytomegalovirus meningitis
- ○ Herpes Simplex encephalitis
- ○ Tuberculosis meningitis

MRI Lumbar spine ✔ Correct answer selected 94%

Nerve conduction studies 3%

Xray lumbar spine 2%

This lady has the classic features of a cauda equina syndrome:

- Back pain
- Radicular pain/numbness down the legs
- Areflexic paralysis of the legs
- Sensory loss in a root distribution
- Reduced sphincter power

She has bilateral lower leg flaccid weakness with absent reflexes and sensory disturbance with loss of perianal sensation. Usually these lesions present at an earlier stage with conus medullaris lesions: urinary retention , constipation , back pain, sacral sensory loss, with or without leg weakness, & saddle anaesthesia. Previous cervical spondylosis and carpal tunnel syndrome release are just distractors and bear no clinical relevance to the current symptoms.

The most likely diagnosis is:

Peer responses

| | |
|---|---|
| Cryptococcal meningitis | 31% |
| Cytomegalovirus meningitis | 2% |
| Herpes Simplex encephalitis | 24% |
| Tuberculosis meningitis ✔ Correct answer selected | 42% |

This is Tuberculosis meningitis and empirical treatment is needed early here. Being homeless and heavy alcohol consumption are risk factors. The negative stains do not rule out TB meningitis and have a sensitivity of only 60%. TB meningitis classically has a raised opening pressure, lymphocytosis, raised protein and a very low glucose.

Bacterial meningitis would expect more neutrophils, viral meningitis typically has >60% serum glucose.

Hypertensive intracerebral haematoma 7%

Perimesencephalic subarachnoid haemorrhage 6%

Subarachnoid haemorrhage (SAH) secondary to left middle cerebral artery aneurysm 6%

Subarachnoid haemorrhage secondary to left posterior communicating artery aneurysm ✔ Correct answer selected 76%

Subarachnoid haemorrhage with hydrocephalus 4%

This young woman presents with typical history of subarachnoid haemorrhage associated with a left third nerve palsy. This suggests a bleed associated with a posterior communicating artery aneurysm.

A 50 year old female smoker presents with a sudden onset headache. There were no precipitating factors. At the onset of the headache she was GCS 15 but on arrival in ED she is GCS 13 (E3 V4 M6). On examination, she has a left sided ptosis with a dilated pupil and the eye looking downwards and outwards. There is extensor plantar responses.

The most likely cause of her condition is:

- ○ Hypertensive intracerebral haematoma
- ○ Perimesencephalic subarachnoid haemorrhage
- ○ Subarachnoid haemorrhage (SAH) secondary to left middle cerebral artery aneurysm
- ○ Subarachnoid haemorrhage secondary to left posterior communicating artery aneurysm
- ○ Subarachnoid haemorrhage with hydrocephalus

A 79 year old woman is admitted via the GP with left sided weakness that had developed over the last two to three days. Three weeks ago she had fallen on compacted sand on the beach whilst playing with her grandchildren and had hit her head. She did not lose consciousness but was a bit dazed. She had a headache afterwards but seemed to recover. She was otherwise fit and well and took no medication.

On examination, GCS is 15, she had mild left sided weakness of arm and leg 4/5 with an equivocal plantar response.

CT head scan revealed a right sided chronic subdural haematoma with some compression of the right ventricle but no midline shift.

Which of the following is the most appropriate management plan for this patient?

- ○ Admit and refer to neurosurgery for evacuation
- ○ Admit and treat with dexamethasone
- ○ Admit and treat with mannitol
- ○ Discharge and treat with outpatient dexamethasone
- ○ Discharge with reassurance that it will resolve and arrange further CT in 3 months

A 45 year old homeless male was admitted after being found collapsed on the street with empty blank brown plastic medication bottles strewn around him and an empty bottle of vodka.

On examination, he had a GCS of 10, was agitated, had a temperature of 39C and was hyperreflexic with clonus. He had a sinus tachycardia of 120 bpm and a blood pressure of 122/80 mmHg. Pupils were equal and reactive.

Which of the following is the likely drug that he has taken in overdose?

- Amitriptyline
- Fluoxetine
- Methanol
- Quetiapine
- Temazepam

A 48-year-old woman with a history of migraine presents to the Emergency Department. She describes a two day history of headache. Initially over the counter analgesia had provided a degree of relief. However, on the second day she experienced the worst headache of her life located in the occiput and associated with vomiting. On examination she is distressed and tachycardia. There are no focal neurological deficits. A CT scan shows subarachnoid haemorrhage, and she is referred to the neurosurgical team for further investigation and management.

With regard to the investigation of subarachnoid haemorrhage how long after the headache onset should a lumbar puncture ideally be performed?

- Immediately on presentation
- 2 hours
- 8 hours
- 12 hours
- 24 hours

A 60 year old male presents with a 3 week history of dysphasia and progressive right arm weakness. He has had headaches for 2 months. There is no history of seizures. There is no other history of note.

On admission, he is confused with a GCS of 14. Pulse is 88 bpm reg, blood pressure 130/78 mmHg and temperature is 37C. He had grade 3 power in the right upper limb, but no other deficit. Blood investigations are normal and Chest x-ray is normal. A CT brain with contrast demonstrates a 5cm irregular enhancing lesion in the left frontal lobe consistent with a primary brain tumour.

Which of the following is the most appropriate initial management for this patient?

- Dexamethasone 4mg QDS
- Hypertonic saline
- Levetiracetam 250mg BD
- Mannitol 20% 0.5g/kg IV
- Phenytoin 300mg OD

neurology outpatient appointment

Discharge with no further appointment required 15%

Refer to neurosurgeons ✔ 10%

Correct answer selected

This patient presented with a collapse and a 13mm colloid cyst is noted in the third ventricle. This is a life threatening lesion that can occlude the third ventricle producing acute hydrocephalus. The patient may well have had a premonitory event where occlusion occurred then release. Although often asymptomatic they can present with acute hydrocephalus as evidenced by headache and collapse. Whilst many colloid cysts are asymptomatic and may not require treatment, some may occlude the foramen of monro causing hydrocephalus and herniation. If as in this case they become symptomatic or larger than 10mm, urgent referral to the neurosurgeons is required. A LP must not be performed as this can precipitate occlusion of the foramen of monro.

A 60 year old male presents with a 3 week history of dysphasia and progressive right arm weakness. He has had headaches for 2 months. There is no history of seizures. There is no other history of note.

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- Phenytoin 300mg OD

Cerebral abscess 1%

Meningioma 2%

Pituitary Tumour 19%

Subarachnoid haemorrhage ✔ 76%

Correct answer selected

Subdural haematoma 2%

This is most likely a SAH from the history with an earlier sentinel bleed. The peak time for rebleeding is around 14 days.

**Further Reading**

- Subarachnoid Hemorrhage

A 48-year-old woman with a history of migraine presents to the Emergency Department. She describes a two day history of headache. Initially over the counter analgesia had provided a degree of relief. However, on the second day she experienced the worst headache of her life located in the occiput and associated with vomiting. On examination she is distressed and tachycardia. There are no focal neurological deficits. A CT scan shows subarachnoid haemorrhage, and she is referred to the neurosurgical team for further investigation and management.

With regard to the investigation of subarachnoid haemorrhage how long after the headache onset should a lumbar puncture ideally be performed?

- Immediately on presentation
- 2 hours
- 8 hours
- 12 hours
- 24 hours

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Which of the following is the most appropriate initial management for this patient?

Peer responses

Dexamethasone 4mg QDS ✔ 87%

Correct answer selected

Hypertonic saline 0%

Levetiracetam 250mg BD 5%

Mannitol 20% 0.5g/kg IV 3%

Phenytoin 300mg OD 3%

The most appropriate initial treatment for this man who has reduced GCS associated with a likely tumour is attempting to reduce the associated with swelling with dexamethasone.

12 hours ✔ Correct answer selected 89%

24 hours 2%

A 'thunderclap' headache warrants consideration of subarachnoid haemorrhage, and may be preceded by a 'sentinel headache'. The traditional investigation route includes a plain CT head scan, with or without lumbar puncture, and cerebral angiography in the face of remaining diagnostic uncertainty.

Sensitivity of a CT head scan is maximal within 12 hours of onset, subsequently dropping to 50% at 5 days. Conversely lumbar puncture should be performed a minimum of 6 hours, but ideally 12 hours, after the onset of symptoms.

The CSF sample must be stored in the dark to prevent bilirubin degradation and sent for analysis of cell count and blood breakdown products. Visually inspecting for xanthochromia is 50% sensitive, the CSF sample is therefore centrifuged and examined with spectrophotometry. Absorbance peaks for oxyhemoglobin (appearing 4-10 hours after a bleed) and bilirubin (appears 10 hours after a bleed) may be detected.

Acute inflammatory demyelinating polyneuropathy ✔ Correct answer selected — 92%

Acute porphyric neuropathy — 3%

Hashimoto's encephalopathy — 1%

Hypokalemic periodic paralysis — 2%

Lyme disease — 1%

This patient has a typical story of Guillain- Barre (AIDP) with ascending weakness and sensory loss. Often but not always, a premorbid flu-like illness is described although this may be innocuous and so missed in the history. Diagnosis can be confirmed with LP which shows acellular CSF with elevated protein.

A 37 year old man was admitted with generalised weakness. He awoke 3 days ago and was aware of pins and needles in the hands and feet. He had some associated weakness in the legs which deteriorated resulting in his admission. He has no past medical history of note.

On examination, he had a BMI of 31kg/$m^2$, a pulse of 90 bpm reg and a blood pressure of 110/72 mmHg. He had diffuse weakness of all four limbs, more marked in the legs than the arms which was more proximal than distal. He could walk but was weak on rising and was slow and slightly incoordinate. He had loss of light touch and vibration to the knees and also in the hands. Tendon reflexes were absent in the lower extremities but present in the biceps and triceps.

Blood investigations including FBC, U+Es and LFTs were normal. Calcium was 2.2 mmol/l (2.2-2.6). CRP was 12 mg/dl (<5).

Which of the following is the likely diagnosis?

- ○ Acute inflammatory demyelinating polyneuropathy
- ○ Acute porphyric neuropathy
- ○ Hashimoto's encephalopathy
- ○ Hypokalemic periodic paralysis
- ○ Lyme disease

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Peer responses

Bed rest and hydration ✔ 14%

Correct answer selected

IV acyclovir 1%

Lumbar puncture with opening pressure measurement 11%

MRI headscan 30%

Neurosurgical referral 44%

This patient presents with typical features of a spontaneous low pressure csf headache with orthostatic features. It improves on lying down. This headache began after weight training with a pain in the neck. This is likely to be the spontaneous csf leak. Low lying cerebellar tonsils on the CT with this history suggests low pressure headache rather than this being due to a Chiari malformation. Doing a LP could make this headache worse.

A 42 year old man presented with headache. Two weeks ago, he was aware of a strain in his neck whilst lifting weights in the gym. He felt that this was a muscle strain. The neck strain resolved after a day or so but since then he became aware of headaches which were debilitating. The headaches are worse as the day progresses and are relieved by lying down. They tend to be focussed over his eyes. Sneezing or coughing would also make the headaches worse.

There were no abnormal findings on neurological examination and observations were otherwise normal. CT head revealed low lying cerebellar tonsils.

Which of the following is the most appropriate approach to the management of this patient?

- Bed rest and hydration
- IV acyclovir
- Lumbar puncture with opening pressure measurement
- MRI headscan
- Neurosurgical referral

Admit, risk factor modification, anticoagulation and and arrange urgent specialist review ✔ Correct answer selected — 47%

Admit, arrange urgent specialist review, echo and MRI as inpatient — 25%

Discharge with risk factor modification and review in TIA clinic — 5%

Discharge with risk factor modification, anticoagulation and review in TIA clinic — 13%

Discharge with risk factor modification and anticoagulation following outpatient MRI with TIA clinic — 9%

This patient has presented with a typical TIA and requires risk factor assessment and modification, particularly blood pressure review and smoking cessation, together with anticoagulation – NOACS or warfarin are acceptable. The patient need not be admitted to facilitate this. There is a 10% risk of completed stroke following TLOF and this can be reduced by up to 80% with risk factor modification.

Recommendation from https://cks.nice.org.uk/stroke-and-tia#!scenario:1

- Discuss the need for admission or observation urgently with a stroke specialist if the person:
  - Has had more than one suspected TIA (sometimes known as crescendo TIA).
  - Has a suspected cardioembolic source or severe carotid stenosis. (our case fits in this category)
  - May be unable to attend for urgent review or lacks a reliable observer at home to contact emergency services if further symptoms occur.

A 59 year old woman attends A&E on a Saturday after suddenly developing dysarthria, diplopia, numbness and weakness of the right face and left hand which lasted approximately 2 hours. The symptoms have now resolved but she describes the symptoms coming on suddenly, over minutes. In her past medical history, she is treated for hypertension, hyperlipidaemia and has stable intermittent claudication not requiring any surgical intervention. She takes amlodipine, simvastatin and aspirin. She is a smoker of 5 cigarettes daily.

On examination, her pulse is 88 bpm irregular, BP 150/85 mmHg but neurological and cardiovascular examination is otherwise normal. There is no carotid bruit. CT scan is normal.

Investigations show normal routine blood tests and an ECG reveals atrial fibrillation.

Which of the following is the most appropriate approach to the management of this patient?

- ○ Admit, risk factor modification, anticoagulation and and arrange urgent specialist review
- ○ Admit, arrange urgent specialist review, echo and MRI as inpatient
- ○ Discharge with risk factor modification and review in TIA clinic
- ○ Discharge with risk factor modification, anticoagulation and review in TIA clinic
- ○ Discharge with risk factor modification and anticoagulation following outpatient MRI with TIA clinic

7 ✔ Correct answer selected 42%

The ABCD2 score is a risk assessment tool designed to stratify TIAs according to future risk of stroke.

A refers to age >60 =1

B refers to blood pressure with either systolic or diastolic >140/90 = 1

C – Clinical Features: Unilateral weakness with or without speech impairment =2. Speech impairment =1

D – Duration: 10-59mins =1. >60 mins = 2

2 – Type 2 diabetes = 1

In our example, the age =1, blood pressure =1, Clinical features =2, duration =2 and he has diabetes =1

The score is therefore 7 which is the maximal score indicating a high risk of a completed stroke 2, 7, 30 and 90 days after a TIA. With an ABCD2 score of 6-7 there is an approximate 10% risk of stroke at 7 days and the recommendation in this case is one of admission with observation.

A 70 year old man presents after a transient ischaemic attack involving weakness of the left arm and lasting approximately 2 hours. He has a past medical history of diabetes for which he takes metformin 1g bd, together with simvastatin 40mg daily and ramipril 10mg daily.

On presentation, his weakness has now entirely resolved. He has a pulse of 80 bpm regular and a blood pressure of 148/92 mmHg.

Which of the following denotes this man's ABCD2 score?

- 1
- 3
- 5
- 6
- 7

Red nucleus 12%

Substantia nigra 24%

Sub-thalamic nucleus ✔ 55%

Correct answer selected

Superior colliculus 7%

Hemiballismus is a rare but dramatic movement disorder, typified by involuntary large amplitude flailing movements. The underlying pathology may be metabolic dysfunction or a structural lesion in the contralateral region of the subthalamic nucleus, related afferent/efferent pathways, or interconnected deep brain nuclei. There are a variety of underlying causative aetiologies, and in older patients vascular events should be considered.

A lesion of the red nucleus can cause a resting tremor and choreoathetosis. The superior and inferior colliculi are involved in visual and auditory processing, respectively. Loss of dopaminergic neurones in the substantia nigra is implicated in the pathology of Parkinson's disease.

You are asked to review a 76-year-old man in Accident and Emergency, who presents with acute onset abnormal movements affecting his left upper extremity associated with numbness. His past medical history includes hypertension. On examination you note irregular, large amplitude, flinging movements of the limb. You suspect he has had a stroke and organise a MRI brain scan. Where do you expect to find the lesion?

- Inferior colliculus
- Red nucleus
- Substantia nigra
- Sub-thalamic nucleus
- Superior colliculus

A patient is admitted to the medical admissions unit. The patient is groaning, opens his eyes to painful stimuli and tries to pull his arm away when pressure is applied to a nail bed. Which of the following is the correct Glasgow Coma Scale score in this man's case?

- 4
- 6
- 8
- 10
- 13

Ufone 10:13 AM 30%
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Question ID #3693

A patient is admitted to the medical admissions unit. The patient is groaning, opens his eyes to painful stimuli and tries to pull his arm away when pressure is applied to a nail bed. Which of the following is the correct Glasgow Coma Scale score in this man's case?

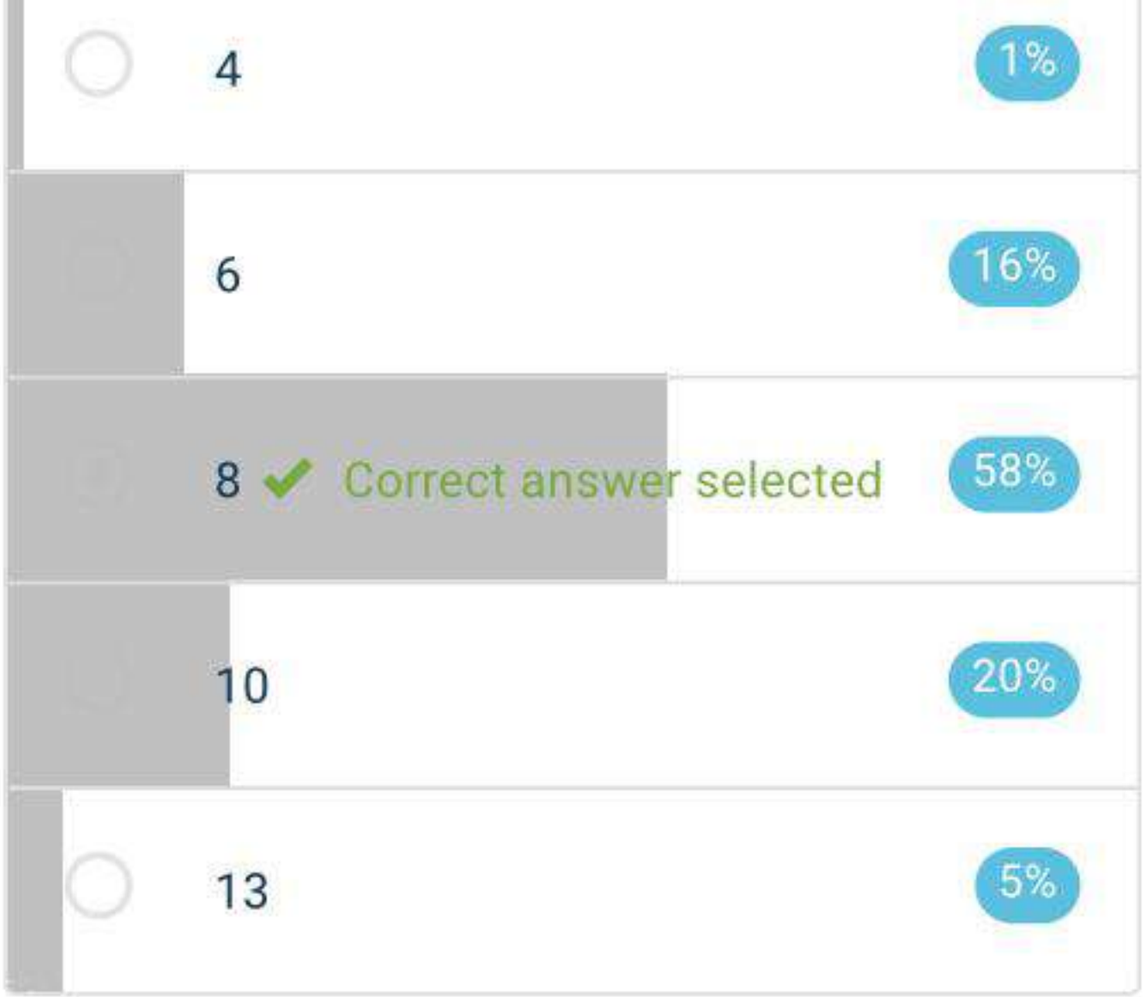
- 4
- 6
- 8
- 10
- 13

Mark Skip Exit

Question ID #7203

A 63-year-old man presents to the Emergency Department following a fall, causing a superficial laceration over his right shoulder blade. His daughter who attends with him gives a history of instability and frequent falls over the last 10 months. She feels his falls relate, in part, to 'taking risky chances' with his mobility. On examination the patient has a staring facial expression and reduced blink frequency. Axial rigidity and slow vertical saccadic eye movements are noted. What is the most likely diagnosis in this patient?

- Corticobasal degeneration
- Dementia with Lewy Bodies
- Idiopathic Parkinson's disease
- Progressive Supranuclear Palsy
- Multi-system atrophy




GCS is based on the following scores:

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Eyes | Not open | Open to pain | Opens to voice | Spontaneous | N/A | N/A |
| Verbal | No sounds | Incomprehensible sounds | Inappropriate words | Confused disorientated | Orientated converses normally | N/A |
| Motor | No movement | Extends to pain | Abnormal flexion to pain | Flexion/withdrawal to pain | Localises to pain | Obeys commands |

Therefore, in this man's case, he opens his eyes to painful stimuli (E2), he makes incomprehensible sounds (V2) and withdraws to pain (M4). Therefore he has an overall GCS of 8. It is very important to be able to calculate the GCS accurately as it has prognostic value.

Progressive Supranuclear Palsy 65%

✔ Correct answer selected

Multi-system atrophy 13%

The diagnosis in this case is progressive supranuclear palsy.

Characteristic features include a staring facial expression with frontalis overactivity and reduced blinking ('Mona-Lisa stare'), axial rigidity with retrocollis and an unsteady gait with tendency to fall backwards, bulbar involvement, supranuclear gaze palsy with impairment of downward gaze which may be preceded by slow saccades. The question above makes reference to the 'motor recklessness' of patients with progressive supranuclear palsy; patients who lack insight into their own postural instability may 'rocket' out of a seat unassisted.

The disease tends to develop between the ages of 55-70 years old, and it affects men more than women. Progressive supranuclear palsy progresses relatively rapidly, with a median survival time of 5.6 years.

| | |
|---|---|
| 24hr Urine free cortisol | 6% |
| EMG | 20% |
| Oral glucose tolerance test | 7% |
| Thyroid function tests ✔ Correct answer selected | 54% |
| Vitamin D concentration | 13% |

This young male presents with a sudden onset of complete weakness with speedy recovery. The diagnosis suggests hypokalaemic period paralysis and one finds that the potassium is low only during the episodes of weakness. However, a form fruste of this is thyrotoxic periodic paralysis and the patient should have TFTs assessed.

A 21 year old male presents with a sudden onset weakness and is unable to move for approximately 1 hour. He gives little other history except for losing two to three pounds in weight over the last two months. On admission to hospital, he has a pulse of 100 bpm, a blood pressure of 105/80 mmHg but he has made a full recovery and muscle strength is normal with normal reflexes and flexor plantar responses. His investigations reveal:

| | |
|---|---|
| **FBC** | Normal |
| **U+Es** | Normal |
| **LFTs** | Normal |
| **Calcium** | 2.25 mmol/l (2.2 - 2.6) |
| **Glucose** | 5.5 mmol/l (3.5 - 5.5) |

Which of the following would be an appropriate investigation for this patient?

- ○ 24hr Urine free cortisol
- ○ EMG
- ○ Oral glucose tolerance test
- ○ Thyroid function tests
- ○ Vitamin D concentration

A 35 year old lady presents with acute onset back and bilateral leg pain for the last 4 days. She also describes sensory loss in the right. She has not opened her bowels for 3 days and at 8am on the day of admission she was incontinent of urine. She has not passed urine since. She is overweight but otherwise has no significant past medical history. On examination, pulse is 80 bpm, blood pressure 122/80 mmHg, she is distressed by pain. She has reduced sensation over the sole of the foot on the right and perianally. The ankle relaxes are absent with normal knee reflexes though power of the lower limb is intact. There is flexor plantar response.

Initial investigations are normal including XR of the spine.

Which of the following is the most appropriate investigation in this patient?

- CT myelogram
- CT spine
- MR Angiography
- MRI lumbar spine
- Nerve conduction studies

A 45 year old male presents with a severe occipital headache that came on suddenly during sexual intercourse. He has otherwise been well without any other medical history of note. He has vomited 4 times. On examination, there is nothing to find and his GCS is 15 with no focal deficit. His headache started at 6am and he underwent a CT brain at 10am. The CT is reported as normal.

Which of the following is most appropriate in the management of this patient?

- CT angiogram
- Immediate Lumbar puncture
- Lumbar puncture after 12 hours
- MR angiogram
- No further investigation required can discharge

MR Angiography 2%

MRI lumbar spine ✔ Correct 89%

answer selected

Nerve conduction studies 1%

This woman has acute onset of back pain associated with weakness, urinary retention, absent ankle jerks and loss of sensation in the S1 dermatome. The diagnosis is Cauda Equina syndrome and the most appropriate investigation is MRI lumbar spine.

Further reading:

Cauda Equina Medscape

**Babinski** sign or other signs of upper motor neuron involvement suggest a diagnosis other than cauda equina **syndrome**, possibly spinal cord compression. ... The destruction of these neurons leads to an early and more severe involvement of bowel, urinary bladder, and sexual dysfunction than seen in those with CES. Jun 14, 2018

A 25-year-old female presents to Accident and Emergency with involuntary movements. Past medical history includes several bouts of depressive illness and an episode of psychosis. On examination Kayser-Fleischer rings are noted in the eyes. Dystonic movements affecting the right upper limb, a postural tremor, as well as a mildly ataxic gait are also noted. Bloods tests reveal derangement of her liver function tests.

Which of the following statements is correct about this disorder?

- Blood tests reveal elevated serum caeruloplasmin
- Inheritance is autosomal recessive
- Reduced 24 hour urinary copper is found on 24 hour urine collection
- The affected gene is on chromosome 4
- Treatment includes a low zinc diet

| Feature | Response | Score |
|---|---|---|
| Best eye response | Open spontaneously | 4 |
| | Open to verbal command | 3 |
| | Open to pain | 2 |
| | No eye opening | 1 |
| Best verbal response | Orientated | 5 |
| | Confused | 4 |
| | Inappropriate words | 3 |
| | Incomprehensible sounds | 2 |
| | No verbal response | 1 |
| Best motor response | Obeys commands | 6 |
| | Localising pain | 5 |
| | Withdrawal from pain | 4 |
| | Flexion to pain | 3 |
| | Extension to pain | 2 |
| | No motor response | 1 |

Lumbar puncture after 12 hours 67%

✔ Correct answer selected

MR angiogram 2%

No further investigation required 22%

can discharge

The history is suggestive of aneurysmal subarachnoid haemorrhage/leak. The CT is reported normal and what is now required is lumbar puncture. LP may be negative if performed less than 2 hours after an SAH occurs; It is most sensitive 12 hours after onset of symptoms.

serum caeruloplasmin

Inheritance is autosomal recessive ✔ Correct answer selected 55%

Reduced 24 hour urinary copper is found on 24 hour urine collection 3%

The affected gene is on chromosome 4 7%

Treatment includes a low zinc diet 5%

Wilson's disease is an autosomal recessive disorder of copper metabolism, resulting from mutation in the adenosine triphosphate 7B gene (ATP7B) on chromosome 13. Subsequent impairment in copper excretion into bile contributes to copper accumulation in organs such as the brain and liver. Neurological features include movements disorders such as parkinsonism, tremor, dystonia and ataxia. Psychiatric features range from behavioural disturbances, through to mood disorders such as depression, as well as psychosis. Biochemical investigations yield reduced serum caeruloplasmin and increased serum and 24 hour urinary copper. Examples of treatment strategies include a low copper diet, D-penicillamine and zinc supplementation.

A 75 year old woman presents to the MAU on Sunday with recurrent episodes of right hand numbness and slurred speech which have occurred on approximately 10 occasions over the last 2 weeks. The episodes are all very similar in nature, each lasting 10 to 40 minutes with complete resolution of the weakness and numbness. They tend to occur at any time of day and come on quite suddenly. In her past history she has been treated for hypertension with amlodipine and also takes simvastatin. She had a right hip replacement 3 years ago which was uneventful.

On examination, she feels that her symptoms have now entirely resolved and there are no neurological deficits on examination. Blood pressure is 136/84 mmHg. CT head scan is reported as normal.

Which of the following is the most appropriate approach to the management of this patient?

- Admit and request specialist review
- Admit, give antiplatelet therapy and specialist review
- Discharge with no further follow up required
- Discharge without antiplatelets and refer to TIA clinic
- Give aspirin, discharge and organise TIA clinic referral

Admit and request specialist review — 6%

Admit, give antiplatelet therapy and specialist review ✔ Correct answer selected — 62%

Discharge with no further follow up required — 0%

Discharge without antiplatelets and refer to TIA clinic — 0%

Give aspirin, discharge and organise TIA clinic referral — 32%

This patient presents with transient loss of function which is typical of TIAs within the carotid territory. This is crescendo TLOF where 2 or more events occur within 1 week, signifying a bad prognosis. The patient requires admission as there is a significant risk of a full blown stroke, and also requires appropriate specialist stroke review with risk factor assessment including carotid dopplers and echo.

A 30 year old woman was transferred from the psychiatric unit to the medical unit with acute confusion. She had been admitted two weeks previously under psychiatry with agitation, auditory hallucinations and catatonia. There was no past history of note and she was otherwise well and taking the combined oral contraceptive pill. She was initially commenced on fluoxetine which failed to improve her condition and then commenced olanzapine.

On examination, she was agitated and confused. GCS was 15 and her temperature was 37C. Pulse 88 bpm and blood pressure 122/88 mmHg. There was no focal neurology and her reflexes were normal with downgoing plantar responses.

Routine bloods were normal. CT scan and MRI were reported as normal and her lumbar results revealed:

| | |
|---|---|
| Protein | 0.44 g/l(<0.45) |
| Glucose | 3.7 mmol/l (>3.5) |
| White cell count | 19 cells/microl 90% lymphocytes (0-5) |

Which of the following is the likely diagnosis?

- ○ Acute catatonic schizophrenia
- ○ Anti-NMDA receptor encephalitis
- ○ Herpes simplex encephalitis
- ○ Neuroleptic malignant syndrome
- ○ Serotonin syndrome

A 45 year old plumber is admitted to the acute medical ward with generalised arthralgia and an inflamed left eye confirmed as uveitis by the ophthalmologists. Examination reveals bilateral parotid swelling and an effusion of the left knee and synovitis of both wrists.

Initial investigations demonstrate:

| | |
|---|---|
| **Haemoglobin** | 12.9 g/dl (13.5-17.7) |
| **Creatinine** | 75 umol/L (50-100) |
| **ESR** | 65 mm/hr (0-10) |
| **CRP** | 43 mg/dl (<5) |
| **ANA** | Negative |
| **Rheumatoid Factor** | Negative |
| **Serum ACE level** | 40 IU/L (8-52) |

2 days after admission the patient is reviewed on the ward round and noted to have developed a left sided seventh cranial nerve palsy.

What is the most likely diagnosis?

- ○ Chronic granulomatous disease
- ○ Lyme Disease
- ○ Reactive arthritis
- ○ Sarcoidosis
- ○ Sjörgren's Syndrome

Acute catatonic schizophrenia 7%

Anti-NMDA receptor encephalitis 29%

Correct answer

Herpes simplex encephalitis ✖ 43%

Incorrect answer selected

Neuroleptic malignant syndrome 11%

Serotonin syndrome 11%

This patient displays typical features of anti-NMDA (N-methyl D-aspartate) receptor encephalitis presenting with subacute agitation, confusion and psychiatric symptoms such as hallucinations and catatonia. The condition affects young females in particular and is often paraneoplastic in aetiology, being associated with ovarian tumours. It is treated by identifying any paraneoplastic precipitant and immune therapy – immune globulin and steroids. The condition is diagnosed by demonstrating the antibodies in the csf.

**Further Reading**

Chronic granulomatous disease 7%

Lyme Disease 36%

Reactive arthritis 6%

Sarcoidosis ✔ Correct answer 35%

selected

Sjörgren's Syndrome 16%

The combination of uveitis, parotiditis and a facial nerve palsy (Heerfordt's syndrome) is highly suggestive of sarcoidosis. The normal serum ACE in this man should not exclude the diagnosis of Sacroidosis and even if elevated is not diagnostic. The other diseases listed may share many of the features of sarcoidosis particularly Sjörgren's Syndrome. Chronic granulomatous disease is a primary immune deficiency syndrome which usually presents early in life with recurrent infections but an X-linked form of the disease can present in adulthood.

Reference:

A CT brain with CT venogram reveals a hypodensity in the right parietal region with gyriform hyperdense areas within the hypodensity; findings in keeping with a venous stroke and moderately extensive secondary haemorrhage. Filling defects in the sagittal sinus are consistent with cerebral venous thrombosis. There is no midline shift.

What is the most appropriate treatment option?

- ◉ Aspirin 300mg for 14 days then switch to clopidogrel 75 mg
- ○ Ceftriaxone 2g iv with aspirin 75 mg and dexamethasone 8 mg iv
- ○ HASU/ITU admission for neuro-observation and supportive treatment only
- ○ Initial anticoagulation with treatment dose of LMWH
- ○ Prednisolone 60 mg with aspirin 300 mg

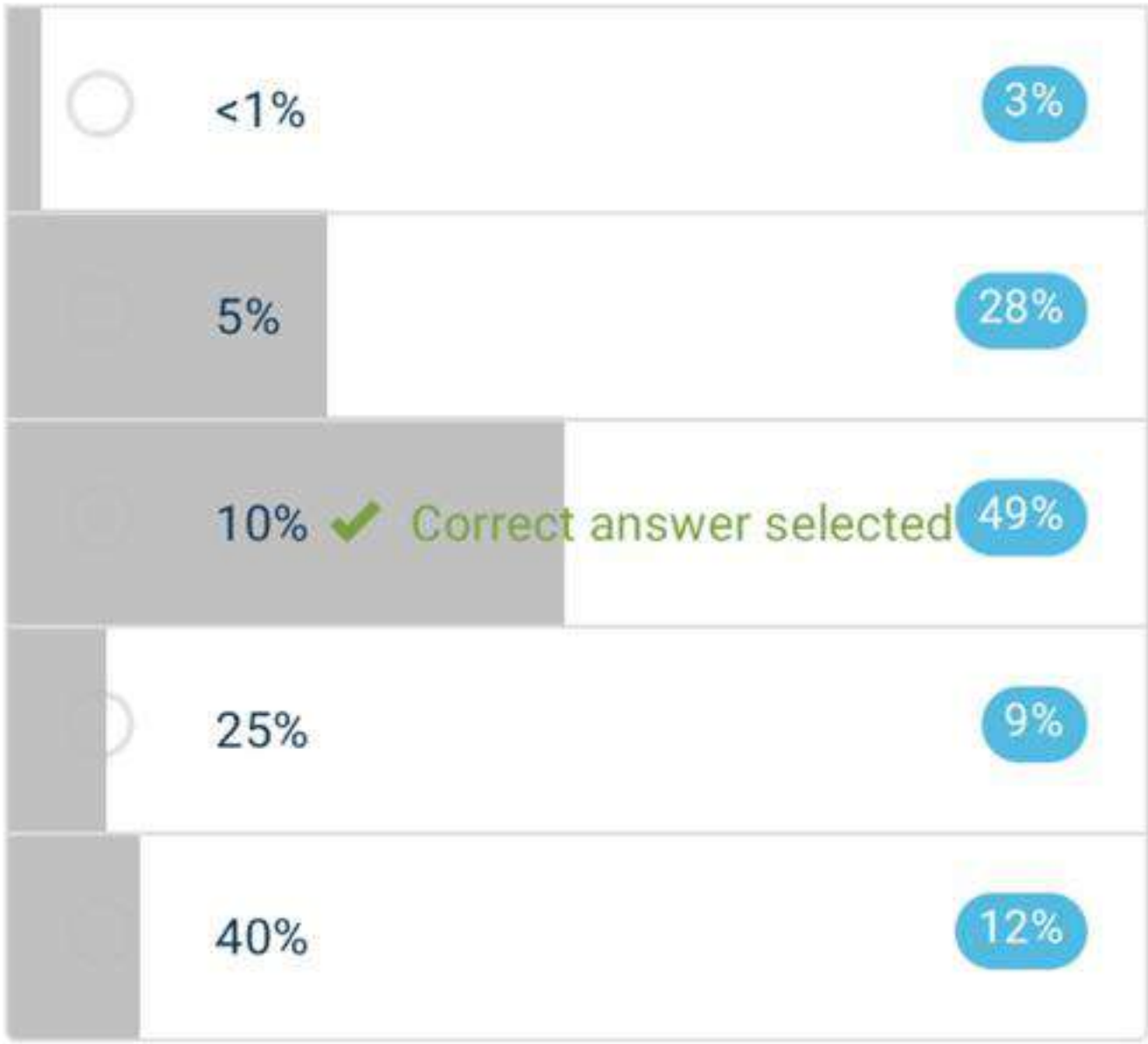
A 26-year-old woman presents to the emergency department with a two week history of headache (VAS 6-7/10). A collateral history from her partner reveals that for the last 5 days she has been excessively "sleepy and tired". She is a smoker (10 cigarettes per day for the last 7 years) and has taken the combined oral contraceptive pill for two years, but otherwise her history is unremarkable. Her mother had a DVT after a 4-hour flight at the age of 38.

On examination she is drowsy (GCS 13/15 – E3: V4: M6). There is no neck stiffness, but she is mildly photophobic, with mild left sided weakness (4/5). Fundoscopy is normal and there are no other neurological findings. Body temperature is 37.4C; RR 18; blood pressure 108/76; HR 91; Sats (room air) 97%.

Blood tests:

| Test | Result | Normal range |
|---|---|---|
| Wbc | 13.2× 109/L | 4.5 to 11.0 × 109/L |
| d-dimer | 974 ng/ml | <230 ng/ml |
| CRP | 36 mg/L | <8 mg/L |

A CT brain with CT venogram reveals a




The important issue here is to calculate this patient's ABCD2 score. The ABCD2 score is a risk assessment tool designed to stratify TIAs according to future risk of stroke.

A refers to age >60 =1

B refers to blood pressure with either systolic or diastolic >140/90 = 1

C – Clinical Features: Unilateral weakness with or without speech impairment =2. Speech impairment =1

D – Duration: 10-59mins =1. >60 mins = 2

2 – Type 2 diabetes = 1

In this case the patient scores 6 based on age, clinical features and duration. This suggests quite a high risk of future stroke of about 12% at 7 days, with guidance suggesting the patient be admitted, investigated and treated.

An 80 year old woman is admitted following an hour history of weakness and loss of speech affecting the left side of the body. By the time she is admitted the weakness has resolved and her speech is improving.

She has a history of hypertension for which she takes amlodipine 10mg daily. She also takes atorvastatin 10mg daily. Otherwise she is well with no other history of note.

On examination, her blood pressure is 144/80 mmHg and her pulse is 68 bpm regular.

Which of the following most accurately suggests the approximate risk of this patient having a stroke within the next week?

- <1%
- 5%
- 10%
- 25%
- 40%

CT head was reported as normal and the patient then went on to have a lumbar puncture, the results of which reveal:

| | |
|---|---|
| Appearance | Clear |
| Protein | 0.42 mg/l (<0.4) |
| Glucose | 4.2 mmol/l (>3.3) |
| White cells | 83/ul (0-5) |
| Red cells | 20 / ul (0-5) |

Which of the following is the most likely diagnosis?

- ○ Aseptic meningitis
- ○ Bacterial meningitis
- ○ Migraine
- ○ Subarachnoid haemorrhage
- ○ Tuberculous meningitis

An 18 year old male of Asian origin was admitted feeling unwell with a headache that had developed over the last 24 hours. He was otherwise fit and well. His only recent travel history was a visit to Pakistan 2 months ago.

On examination, he had a temperature of 38.8C, some mild neck stiffness and mild photophobia. His pulse was 88 bpm, blood pressure 118/80 mmHg. No obvious rash was present and there were no abnormal neurology.

Results reveal:

| | |
|---|---|
| FBC | Normal |
| U+Es | Normal |
| CRP | 15 mg/dl (<5) |

CT head was reported as normal and the patient then went on to have a lumbar puncture, the results of which reveal:

| | |
|---|---|
| Appearance | Clear |
| Protein | 0.42 mg/l (<0.4) |
| Glucose | 4.2 mmol/l (>3.3) |
| White cells | 83/ul (0-5) |

A 43 year old man is admitted under the general medical intake with generalised progressive weakness of his arms and legs. During the preceding 5 days he complained of flu like symptoms and muscle aches. There is no change in his symptoms after exercise such as walking up a flight of stairs. He compares the discomfort in his legs to a "swarm of bees crawling over his thighs". He has noticed difficulty in swallowing but no nasal regurgitation of liquids. His speech and facial expression remain unchanged. There is no family history of muscle disorders.

On examination he displays marked truncal weakness and has difficulty even to sit upright. He has difficulty holding his head up. The muscle bulk of his arms and legs appear normal with no wasting or hypertrophy. There is no fasciculation of the muscles. His limb tone is reduced, and power graded 3/5 on hip flexion and shoulder abduction. Cranial nerve examination is normal. Respiratory examination is unremarkable.

| | | |
|---|---|---|
| **CK** | 13,000 U/L | (30-200 U/L) |
| **CRP** | 120mg/L | (<5mg/L) |
| **ESR** | 87 mm/h | (<10mm/h) |

Urine dipstick: No abnormality detected

Polymyositis ✔ Correct answer 56%

selected

Rhabdomyolysis 2%

Although there is a tendency to overdiagnose polymyositis, this is the most likely diagnosis of the options listed. The presence of symmetrical proximal muscle weakness, dysphagia, elevated CK, and myopathic EMG findings are highly suggestive of polymyositis. Alanine (ALT) and aspartate (AST) transaminases are often raised in polymyositis. A muscle biopsy would be needed to confirm the diagnosis. It is important to determine this patient's autoantibody status, particularly with regard to anti-tRNA synthetase antibodies- which are positive in 30% of polymyositis patients (also known as Anti-Jo1 antibodies) - since this is associated with interstitial lung disease, Raynaud's phenomenon, "mechanic's hands" (manifest as roughened cracked skin of the fingers), and arthritis. The presence of anti-synthetase antibodies carries a poorer prognosis[1].

Myoglobinuric acute renal failure has been reported in polymyositis, but is rare[2]. The absence of fasciculation and bulbar symptoms, and myopathic EMG findings makes motor neurone disease unlikely. Limb-girdle dystrophy is typically characterised by marked hypertrophy of the calves, but with gross muscle weakness. This gentleman's muscle bulk appears normal, making limb girdle dystrophy unlikely. McArdle's syndrome is characterised by a "second wind phenomenon" where patients experience weakness on exercise, but then following a brief period of rest the muscle power returns significantly better than before. During exacerbations of McArdle's disease patients may be at risk of rhabdomyolysis. His

Urine dipstick: No abnormality detected.

Urine myoglobin: Not detected.

| | | |
|---|---|---|
| **Sodium** | 135 mmol/L | (135-145) |
| **Potassium** | 4.3 mmol/L | (3.5-5.0) |
| **Urea** | 5.9 mmol/L | (2.5-7.0) |
| **Creatinine** | 105 micromol/L | (70-110) |
| **25OHVit D** | 52 ng/L | (desirable levels > 30ng/L) |
| **Free T4** | 20.8 pmol/l | (9.8 - 23.8) |
| **TSH** | 2.2 mu/l | (0.5-4.5) |

Electromyography is reported as:
Myopathic potentials: low amplitude, short duration polyphasic units on voluntary activation. Increased spontaneous activity with fibrillations and complex repetitive discharges.

Which is the most likely diagnosis?

- ○ Limb-girdle muscular dystrophy
- ○ McArdle's syndrome
- ○ Motor neurone disease
- ○ Polymyositis
- ○ Rhabdomyolysis

A 21 year old male student is brought to A+E by his friends who have been increasingly concerned about him as he took a hallucinogenic substance the day before and had a 'bad trip'. Since then, he has become confused and drowsy. They do not know what substance he took but informs you that he has taken recreational drugs before.

On examination he is drowsy with a GCS of 12, blood pressure of 112/72 mmHg and a pulse of 110 bpm. He also has a liver flap. His oxygen saturations are 99% on air. There are no specific abnormalities on neurological examination.

His blood results reveal:

| | |
|---|---|
| FBC | Normal |
| U+Es | Normal |
| CRP | 55 mg/l (<5) |
| Bilirubin | 50 micromole/l (0-18) |
| Alkaline Phosphatase | 250 IU/l (50-110) |
| AST | 1500 IU/l (10-50) |
| ALT/td> | 1500 IU/l (10-500 |

Which of the following is the likely cause for his presentation?

- Amphetamines
- Cocaine
- Ecstasy (MDMA)
- Ketamine
- Psychedelic mushrooms

Ecstasy (MDMA) 21%

Ketamine 12%

Psychedelic mushrooms ✔ 57%

Correct answer selected

This young man has developed acute liver failure as a likely consequence of the ingestion of a hepatotoxic drug. Such drugs include psychedelic mushrooms, anti-TB therapy, anticonvulsants and paracetamol. In this case the consumption of psychedelic mushrooms may well be the precipitant of acute liver failure with psilocybin mushrooms often being confused with amatoxin mushrooms, which can produce fatal hepatotoxicity.

A 68 year old man is admitted on the acute medical take, via the GP, following repeated episodes of falling. He was living at home with a four times a day package of care, and family assistance, but had become increasingly dependent on his family as his mobility had significantly deteriorated over the past 6 months.

On admission the patient is complaining of hallucinations and is concerned that the nursing staff are "out to get him". He is not aggressive but his family states that these hallucinations have been worsening and at times he can be very disorientated and confused.

Physical examination is unremarkable apart from some minor cogwheeling rigidity in his hands, and a shuffling gait with reduced arm swing. He showed evidence of mild cognitive deficit on testing, and was unable to draw a clock.

Bloods were in the normal range, ECG showed normal sinus Rhythm and CT head showed mild small vessel disease.

He is finding the hallucinations to be distressing. What is the most appropriate treatment for this?

- ○ Haloperidol
- ○ Lorazepam
- ○ Pramiprexole
- ○ Rivastigmine
- ○ Trazadone

3 months 1%

6 months ✔ Correct answer 74%

selected

9 months 2%

12 months 20%

Can commence driving immediately as investigations are normal 3%

After a single unprovoked seizure, an individual can resume driving after 6 months provided there is low risk of seizure recurrence; this is likely here given no structural abnormalities were found and no epileptiform activity on EEG.

**Further Reading**

A 55 year old man is admitted through MAU with 1 week history of deteriorating weakness and more recent nausea. His background includes a 10 yr history of diabetes and hypertension. He is taking gliclazide 80mg bd, bendrofluazide 2.5mg/d, atorvastatin 10mg/d and ramipril 10 mg/d.

On Examination he appears ill and weak. His temperature is 37 C and oxygen saturation is 97% on air. His blood pressure is 154/100 mmHg, heart rate 92 bpm reg and respiratory rate is 22/min.

Results:

| | |
|---|---|
| Sodium | 141 mmol/l (134-144) |
| Potassium | 7.6 mmol/l (3.5-5.5) |
| Urea | 19 mmol/l (3-8) |
| Creatinine | 350 micromol/l (50-100) |
| pH | 7.36 |
| Bicarbonate | 20 mmol/l |

His ECG reveals some QRS widening and tenting of T waves.

Which of the following is the most appropriate initial treatment for this man?

StudyPRN

# Acute Medicine SCE Revision Renal medicine

Haloperidol 18%

Lorazepam 19%

Pramiprexole 17%

Rivastigmine ✔ Correct answer 41%

selected

Trazadone 5%

The patient has features of Parkinsonism with a worsening mobility, frequent falls, fluctuating levels of lucidity and hallucinations suggesting a diagnosis of Lewy Body Dementia.

Anticholinergic medication and typical antipsychotics medication are contraindicated in Lewy Body Dementia. Anticholinergic medication increases the mortality when used in Lewy Body Disease three times above average.

Which of the following is the most appropriate initial treatment for this man?

- 10mg nebulised salbutamol
- 10mls 10% IV calcium gluconate as a stat dose
- 100mls of 8.4% sodium bicarbonate given over 30 mins
- 50mls IV 50% dextrose plus 10 iu insulin given over 10 mins
- Oral Calcium resonium

| | | |
|---|---|---|
| | | seconds |
| Urea | 23 mmol/l | 2.5-6.7 mmol/l |
| Serum creatinine | 488 mmol/l | 88-120 mmol/l |
| Bilirubin | 3 umol/l | 2-17 umol/l |
| ALT | 35 iu/l | 5-40 iu/l |
| Serum albumin | 22 g/l | 34-48 g/l |
| C3, C4 | Within limits | |
| Anti HCV | Positive | |
| HCV PCR RNA | Not detected | |
| HBsAg | Negative | |

Urine Analysis

| | | |
|---|---|---|
| Blood | Nil | |
| Protein | ++++ | (24 hours quantification: 6.7g) |
| Glucose | + | |
| Microscopy | Few hyaline casts | |

What is the most likely diagnosis?

- ○ Amyloidosis
- ○ Diabetic nephropathy
- ○ HCV related cryoglobulinemia
- ○ HCV related membranoproliferative glomerulonephritis
- ○ Interferon induced focal segmental glomerulosclerosis

A 40 year old Asian gentleman has been referred from the liver clinic where he is being treated for hepatitis C with pegylated interferon and ribavirin for the last 12 weeks. Over the last 3 weeks the patient has noted swelling of his ankles and feet along with shortness of breath on exertion. There is no history of a decrease in urine output, although he has noted frothing of urine.

On examination, he has a blood pressure of 130/80 mmHg, a pulse rate of 100/minute and a temperature of 38C. He has significant pedal edema. On chest examination, he has dull percussion note at both bases with decreased breath sounds and decreased vocal fremitus. On abdominal examination, there is no visceromegaly but shifting dullness is present.

Laboratory investigations reveal:

| | | |
|---|---|---|
| Hb | 11.6 g/dl | 13-18 g/dl |
| WBC | 9 x $10^9$/l | 4-11 x $10^9$/l |
| Platelets | 455 x $10^9$/l | 150-300 x $10^9$/l |
| PT | 12 seconds | 12-14 seconds |
| APTT | 34 seconds | 30-46 |

10mls 10% IV calcium gluconate as a stat dose ✔ Correct answer selected 88%

100mls of 8.4% sodium bicarbonate given over 30 mins 0%

50mls IV 50% dextrose plus 10 iu insulin given over 10 mins 12%

Oral Calcium resonium 0%

This patient has severe and life threatening hyperkalaemia as determined by the potassium above 6.5 and the widened QRS complexes and tented T waves on the ECG. The most important initial step is protection of the heart – hence the patient should receive 10 mls calcium gluconate and the ECG should be repeated to look for improvement. At the same time, the insulin and dextrose infusion should be started, although this may take 1 hour to take effect by reducing the potassium. In this case, the ACE inhibitor needs to be stopped and in conjunction with the acute kidney injury may be the precipitant.

HCV related cryoglobulinemia 25%

HCV related membranoproliferative glomerulonephritis 43%

Interferon induced focal segmental glomerulosclerosis ✔ Correct answer selected 26%

The main causes of nephrotic range proteinuria include diabetic nephropathy, minimal change disease, focal segmental glomerulosclerosis, membranous nephropathy and amyloidosis. Hepatitis C related renal disease manifests as either membranoproliferative glomerulonephritis, membranous nephropathy or cryoglobulinemia. The mainstay treatment in all 3 cases remains treatment of hepatitis C itself with a target of achieving seroconversion. Considering seroconversion is achieved in this case the diagnosis is unlikely to be one of these 3 options. Interferon therapy is known to cause focal segmental glomerulosclerosis with mainstay treatment being removal of offending agent.

**Further Reading**

A 42 year old business man attends the clinic following a recent acute admission with an unprovoked generalized tonic-clonic seizure. This was his first ever seizure. His CT and MRI brain are both normal as is his EEG. He is very keen to resume driving (standard driving licence). How long does the DVLA state he cannot drive for?

- 3 months
- 6 months
- 9 months
- 12 months
- Can commence driving immediately as investigations are normal

switch to clopidogrel 75 mg

Ceftriaxone 2g iv with aspirin 75 mg and dexamethasone 8 mg iv — 0%

HASU/ITU admission for neuro-observation and supportive treatment only — 27%

Initial anticoagulation with treatment dose of LMWH ✔ Correct answer selected — 67%

Prednisolone 60 mg with aspirin 300 mg — 0%

Even in the presence of haemorrhage anticoagulation is recommended for treatment of cerebral venous thrombosis. The rationale is to prevent thrombus extension, to facilitate recanalization and to prevent DVT or PE. Initial anticoagulation is usually weight based Low Molecular Weight Heparin or adjusted dose of Unfractionated Heparin followed by Vitamin K antagonists.

| | | |
|---|---|---|
| Aseptic meningitis ✔ Correct<br>answer selected | | 45% |
| Bacterial meningitis | | 15% |
| Migraine | | 0% |
| Subarachnoid haemorrhage | | 6% |
| Tuberculous meningitis | | 35% |

This patient is likely to have aseptic meningitis from the description in the history and the LP findings. The slight elevation of the WCC and protein would be in keeping with this diagnosis. We are not given any history regarding the microbiological assessment or gram staining of the CSF as is often the case. The patient should be treated with analgesia and can be discharged. The correct interpretation of the CSF is important in acute medicine and will be a focus in exams.

Commence Benzbromarone ✔ 38%

Correct answer selected

Commence long term low dose colchicine. 9%

Commence long term oral steroids 14%

Commence Probenecid 32%

Commence Sulphinpyrazone 7%

Recent guidance from the British Society of Rheumatology suggests that if a patient's gout is not adequately controlled on allopurinol and they have renal impairment then they should be switched to Benzbromarone. This drug needs to be carefully monitored as it is associated with liver function abnormalities.

Reference:


- Jordan KM, Cameron JS, Snaith M, Zhang W, Doherty M, Seckl J, Hingorani A,Jaques

ANCA 19%

Renal and coeliac Angiography 25%

✔ Correct answer selected

CT abdomen and pelvis 15%

Skin biopsy 41%

USS abdomen 1%

This patient presents with non specific features but diffuse abdominal pain and a positive urine dipstick with mild renal impairment. Although all the above investigations may be required to rule out other causes for these symptoms the main differential in this man is between Polyarteritis Nodosa (PAN) and Microscopic polyangiitis (MP). Although p-ANCA is usually positive in MP this is not always the case however the findings of aneuryms, segmental arterial narrowing and pruning of the peripheral vascular tree is seen in PAN but not MP making this the most likely test to confirm the diagnosis.

PAN is now divided into classical PAN and that associated with Hepatitis B infection. This distinction is important as management is different with Hepatitis B associated PAN being treated with antiviral agents and plasma exchange in addition to steroids in the first instance. Cyclophosphamide and steroid induction therapy remains the mainstay of treatment for non-Hepatitis B associated PAN.

A 55 year old man is seen on the acute medical ward with a month long history of fever, myalgia, arthralgia and abdominal discomfort. Examination reveals no synovitis but diffuse abdominal tenderness and a few scattered subcutaneous nodules. Urine dipstick is positive for blood and protein. Initial investigations are as follows:

| | | |
|---|---|---|
| **CRP** | 95 mg/dl | (<5) |
| **ESR** | 72 mm/hr | (0-10) |
| **WBC** | 13 x$10^9$/l | (4-11) |
| **Creatinine** | 135 umol/L | (50-100) |
| **ANA** | Negative | |

Which of the following is most likely to confirm the diagnosis in this patient?

- ○ ANCA
- ○ Renal and coeliac Angiography
- ○ CT abdomen and pelvis
- ○ Skin biopsy
- ○ USS abdomen

Cardiac syncope 19%

Diabetic ketoacidosis ✖ 38%

Incorrect answer selected

Hypoglycaemic coma 0%

Lactic acidosis ← Correct answer 42%

Stroke 1%

There is a high anion-gap metabolic acidosis in this scenario. In the context of myocardial infarction and hypotension there is a buildup of lactate (>2 mmol/l) due to tissue hypoperfusion - also known as a type A lactic acidosis. Correction of perfusion – by improving cardiac pumping or vascular circulation will reduce lactate and correct the metabolic acidosis. The glucose in this scenario is elevated, not because the patient has diabetes, but because it represents a stress response that accompanies cortisol release.

A 70-year-old woman is found unconscious and is brought in to the Accident and Emergency unit. She attends alone with little information about her past medical history. On examination, her heart rate is 45 bpm and peripherally shut down. Her BP is 80/60 mmHg. An ECG confirms sinus rhythm with a rate of 45 bpm with changes consistent with inferior myocardial infarction.

Blood tests show:

| | | **Normal ranges** |
|---|---|---|
| **Sodium** | 137 mmol/L | 137–144 mmol/L |
| **Potassium** | 5.5 mmol/L | 3.5–4.9 mmol/L |
| **Bicarbonate** | 13 mmol/L | 20–28 mmol/L |
| **Chloride** | 106 mmol/L | 95–107 mmol/L |
| **Urea** | 7.5 mmol/L | 2.5–7.0 mmol/L |
| **Glucose** | 15.3 mmol/L | 3.0–6.0 mmol/L |

Which one of the following is the most probable cause for the blood picture seen?

- Cardiac syncope
- Diabetic ketoacidosis
- Hypoglycaemic coma
- Lactic acidosis

A 50 year old man of Nigerian origin presents to Accident and Emergency with worsening of shortness of breath for the last 2 weeks and 2 episodes of hemoptysis this morning. He reports a decrease in urine output in the last 3 days as well. There is no history of fever, night sweats or weight loss. He has no significant medical history and is not on any regular medication. On examination, he has a pulse rate of 100/min, blood pressure of 180/100 mmHg and appears pale. He has bilateral pedal edema with raised JVP. Chest auscultation reveals bilateral lower zone pan-inspiratory crackles with bronchial breathing. His investigations reveal:

Hb: 7.5 g/dl

WBC: 13.6 x 109/l

Platelets: 455 x 109/l

PT/INR: Within limits

Urea: 23 mmol/l

Serum creatinine: 488 umol/l

CXR (PA view): Non-homogenous fluffy shadowing over lower zones bilaterally.

Urine Analysis:

Blood: +++

Protein:++++

Microscopy: RBC casts present

A 27 year old student who recently returned from a 2 week family vacation in Spain presents to Accident and Emergency with 3 episodes of bloody diarrhea and a decrease in urine output over the past 36 hours. There is no significant past history.

On examination, he remains afebrile with normal blood pressure and pulse rate. He appears pale with no other significant finding. His laboratory tests reveal:

| | | |
|---|---|---|
| Hb | 10.1 g/dl | 13-18 g/dl |
| WBC | 7.6 x $10^9$/l | 4-11 x $10^9$/l |
| Platelets | 70 x $10^9$/l | 150-300 x $10^9$ |
| PT | 12 seconds | 12-14 seconds |
| APTT | 34 seconds | 30-46 seconds |
| Creatinine | 287 umol/l | 50-120 umol/l |
| Urea | 66 mmol/l | 2.5-6.7 mmol/l |
| AST | 33 iu/ | 5-40 iu/l |
| ALT | 39 iu/l | 5-40 iu/l |
| LDH | 1100 iu/l | < 300 iu/l |
| Peripheral Film | Reveal multiple schistocytes | |

What is the most likely causative organism?

- E. Coli 0157:H7
- Rota virus
- Salmonella typhi
- Schistosoma mansoni
- Vibrio cholera

Goodpasture's syndrome ✔ 95%

Correct answer selected

Infective endocarditis 0%

Goodpasture's syndrome is renopulmonary syndrome characterised by lung hemorrhages and kidney dysfunction. Lung hemorrhages will manifest as infiltrates on chest X Ray and would show an increase in DLCO, as seen in this patient. Renal dysfunction classically manifests as a rapidly progressive glomerulonephritis with cellular crescents on renal histology. Antibodies against the basement membrane of glomeruli can be detected in serum to aid diagnosis. Mainstay treatment entails aggressive immunosuppression and plasmapheresis.

Further reading:

Urine Analysis:

Blood: +++

Protein:++++

Microscopy: RBC casts present

Lung Function Tests:

Increased Diffusion Gradient of Carbon Monoxide (DLCO) seen.

What is the most likely diagnosis?

- Acute Kidney Injury
- Churg Strauss syndrome
- Community acquired pneumonia
- Goodpasture's syndrome
- Infective endocarditis

E. Coli 0157:H7 ✔ Correct 90%

answer selected

Rota virus 0%

Salmonella typhi 2%

Schistosoma mansoni 8%

Vibrio cholera 0%

The presence of renal failure, thrombocytopenia and microangiopathic hemolytic anemia as evidenced by an elevated LDH and schistocytes points to a diagnosis of thrombotic microangiopathy. The absence of fever and neurological symptoms make “Hemolytic Uremic Syndrome” the likely diagnosis. Typical hemolytic uremic syndrome is associated with diarrhea, the most common causative organism of which is E. Coli 0157:H7.

Intravenous hydralazine 25%

Intravenous nitrates 27%

Oral hydralazine 4%

Oral lisinopril ✔ Correct answer 43%

selected

Oral methyldopa 1%

Severe hypertension in the setting of a patient with systemic sclerosis as suggested by the sclerodactyly, Raynaud's and microstomia, should always raise the suspicion of "scleroderma renal crisis".

ACE inhibitors remain the mainstay treatment considering the hypertension is always hyperreninemic.

**Further Reading**

A 27 year old Caucasian lady presents to Accident & Emergency with severe headache and restlessness. Her blood pressure is found to be 210/110 mmHg. She is not known to be hypertensive previously but was started on amlodipine 10mg a few months ago by her rheumatologist to improve 'blood flow to her hands'. You notice microstomia and sclerodactyly.

Her blood work reveals:

| | | |
|---|---|---|
| Hb | 9.1 g/dl | 13-18 g/dl |
| WBC | 6.4 x $10^9$/l | 4-11 x $10^9$/l |
| Platelets | 99 x $10^9$/l | 150-300 x $10^9$/l |
| Urea | 16 mmol/l | 2.5-6.7 mmol/l |
| Creatinine | 118 mmol/l | 50-120 umol/l |
| Serum Sodium | 141 mmol/l | 135-145 mmol/l |
| Serum Potassium | 4.6 mmol/l | 3.5-5.0 mmol/l |

What is the drug of choice to control her blood pressure?

- ○ Intravenous hydralazine
- ○ Intravenous nitrates
- ○ Oral hydralazine
- ○ Oral lisinopril
- ○ Oral methyldopa

| | |
|---|---|
| IV labetalol ✔ Correct answer selected | 80% |
| IV furosemide | 0% |
| Oral amlodipine | 13% |
| Oral ramipril | 7% |
| Sublingual nifedipine | 0% |

Severe hypertension is classified as a systolic above 180 and a diastolic above 110 mmHg. Hypertensive crisis is associated with severe hypertension in the presence of end organ damage such as retinopathy; flame shaped haemorrhages and papilloedema; hypertensive encephalopathy; acute coronary syndrome; pulmonary oedema. This requires urgent treatment with the aim of reducing blood pressure by roughly 20-25%. IV drugs such as labetalol, nitroprusside (unlicensed), nicardipine and hydralazine can be used. In those with severe hypertension but lacking end organ damage, this is termed hypertensive urgency and oral antihypertensives can be employed.

Whilst nitroprusside is a potential answer here, it is not licensed for this use, is difficult to accurately titrate being very short acting, needs HDU monitoring, and with renal or hepatic failure can be associated with thiocyanate toxicity. Labetalol is the better answer.

A 36-year-old male is referred in by the GP after presenting with headaches which have deteriorated over the last 2 weeks. He is found to have a high blood pressure of 220/120 mmHg and is admitted as an emergency. There is nothing particularly of note in his history. He is a non-smoker and drinks little alcohol. He does not take any drugs and denies illicit substance abuse.

On examination he has a BMI of 30.3 kg/m$^2$, a blood pressure of 224/122 mmHg and a pulse of 88 bpm. Examination of his fundi reveal some flame shaped haemorrhages. His ECG reveals left ventricular hypertrophy and urinalysis is negative.

Tests reveal:

| Test | Result | Normal range |
|---|---|---|
| Sodium | 141 mmol/l | 134-144 |
| Potassium | 3.5 mmol/l | 3.5-5 |
| Urea | 9.2 mmol/l | 3-8 |
| Creatinine | 110 micromol/l | 50-100 |

Which of the following is the most appropriate approach to the management of this patient?

- IV labetalol
- IV furosemide
- Oral amlodipine
- Oral ramipril
- Sublingual nifedipine

Peer responses

| | |
|---|---|
| Intravenous antibiotics | 3% |
| Intravenous bortezomib | 1% |
| Intravenous calcium gluconate | 1% |
| Intravenous chloroquine | 3% |
| Plasmapheresis ✔ Correct answer selected | 92% |

The presence of renal failure, thrombocytopenia and microangiopathic hemolytic anemia as evidenced by an elevated LDH and schistocytes points to a diagnosis of thrombotic microangiopathy. The presence of fever and neurological symptoms make “Thrombotic Thrombocytopenic Purpura” the likely diagnosis. The mainstay of treatment is plasmapheresis.

**Further Reading**

A 45 year old Hispanic gentleman known to have diabetes and hypertension for the last 5 years presents to Accident and Emergency with an episode of generalized tonic clonic seizure. His wife is accompanying the him and she reports her husband to be unwell for the last 4-5 days with a low grade fever, shortness of breath and a decrease in urine output. He has been on metformin 500 mg BD, lisinopril 5mg OD, aspirin 75mg od and simvastatin 20mg daily with reasonable glycemic and blood pressure control.

On examination, he has a GCS of 14/15 with a blood pressure of 170/100 mmHg. Neurological examination is essentially unremarkable. His blood tests reveal:

| | | |
|---|---|---|
| Hb | 9.8 g/dl | 13-18 g/dl |
| WBC | $7.8 \times 10^9$ | $4\text{-}11 \times 10^9$/l |
| Platelets | $46 \times 10^9$/l | $150\text{-}300 \times 10^9$/l |
| PT | 12 seconds | 12-14 seconds |
| APTT | 34 seconds | 30-46 seconds |

Ufone 11:58 PM 99%
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Congestive heart failure 2%

Diuretic therapy ← Correct answer 31%

Hypocortisolism 7%

Syndrome of inappropriate ADH secretion ✖ Incorrect answer selected 51%

It is important to note that this patient is dehydrated, hence hypovolaemic hyponatraemia, which narrows the diagnosis down to either cerebral salt wasting syndrome or diuretics. The absence of any history of cerebral insult rules out cerebral salt wasting, leaving diuretics to be the answer. A diagnosis of hyponatremia in hypocortisolism or syndrome of inappropriate ADH secretion is made in euvolemic patients. Patients with congestive heart failure and hyponatremia are volume overloaded.

| | | |
|---|---|---|
| Hb | 14.4 g/dl | 13-18 g/dl |
| WBC | 13.6 x $10^9$/l | 4-11 x $10^9$/l |
| Platelets | 369 x $10^9$/l | 150-300 x $10^9$/l |
| Serum Sodium | 116 mmol/l | 135-146 mmol/l |
| Serum Potassium | 5.0 mmol/l | 3.5-5.0 mmol/l |
| Serum Urea | 8 mmol/l | 2.5-6.7 mmol/l |
| Serum Creatinine | 88 umol/ | 50-120 umol/l |
| CRP | 54 mg/l | <5.0 mg/l |
| CXR PA View | ight Lower Zone Homogenous Opacity with air bronchogram | |

What is the most likely cause of his hyponatremia?

- ○ Cerebral salt wasting syndrome
- ○ Congestive heart failure
- ○ Diuretic therapy
- ○ Hypocortisolism
- ○ Syndrome of inappropriate ADH secretion

An 85 year old man is admitted from a nursing home because of disorientation. The carer accompanying the gentleman reports that the patient had gradually become withdrawn over the past 2 days when he developed a low grade fever, accompanied by a dry cough, until he became totally disoriented this morning. He is known to suffer from congestive heart disease, for which he takes spironolactone and furosemide, along with bisoprolol and losartan for his hypertension.

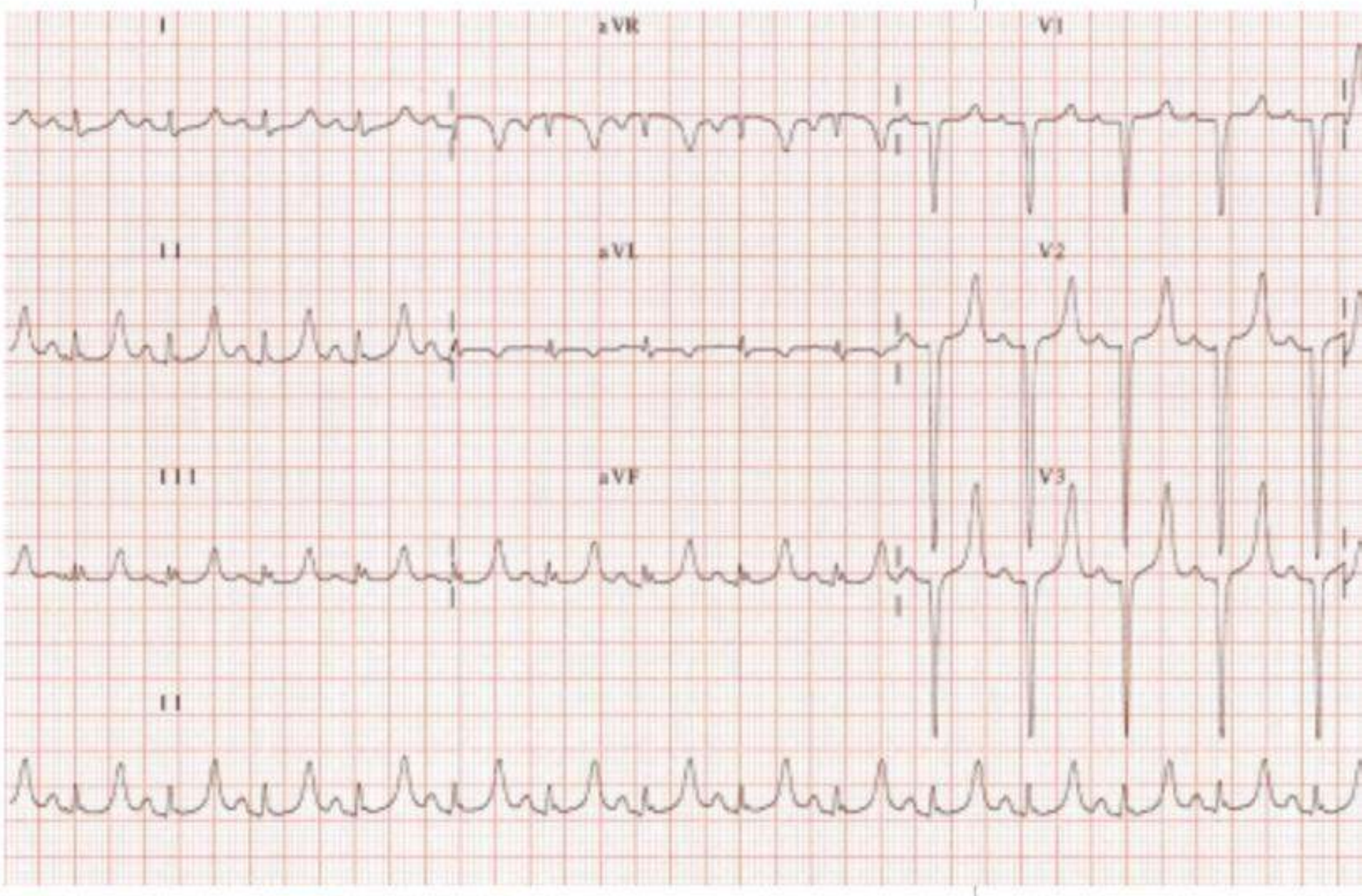
On examination, he has a temperature of 38 degree celsius, a pulse of 100/minute and a blood pressure of 136/70 mmHg. He does not have any pedal edema, although his mucous membranes appear dry with poor skin turgor. His chest examination reveals coarse pan-inspiratory crackles with increased vocal fremitus over the right lower hemithorax. No focal neurological deficit could be ascertained.

Investigations reveal:

| | | |
|---|---|---|
| Hb | 14.1 g/dl | 13-18 g/dl |
| WBC | 13.6 x $10^9$/l | 4-11 x $10^9$/l |

Question ID #3780

This is the ECG obtained on a 77 year old man with type 2 diabetes who was admitted with lethargy and tiredness.




What does the ECG suggest?

- ○ Hypercalcaemia
- ○ Hyperkalaemia
- ○ Hypocalcaemia
- ○ Hypokalaemia
- ○ Hypothermia

| | |
|---|---|
| BK virus nephropathy | 7% |
| Cytomegalovirus disease ✔ Correct answer selected | 81% |
| Leptospirosis | 5% |
| Miliary tuberculosis | 0% |
| Posttransplant lymphoproliferative disease | 7% |

The most common time for opportunistic infections to occur secondary to immunosuppression is the 1-6 month period post-transplant, as encountered with this patient. CMV infection pneumocystis is an opportunistic systemic infection with varied presentations ranging from colitis and hepatitis to pneumonitis. Diagnostic investigations include DNA polymerase chain reaction assays, antibody assays and organ specific procedures like colonoscopy etc.

Hyperkalaemia ✔ Correct 94%

answer selected

Hypocalcaemia 1%

Hypokalaemia 1%

Hypothermia 2%

This ECG shows tented T waves and p waves with a tachycardia suggestive of hyperkalaemia.

A 56 year old gentleman known to have adult polycystic kidney disease presents to Accident and Emergency with complaints of pain in the left flank, fever, pyuria and dysuria. He regularly takes lisinopril 5 mg to control his hypertension.

On examination, he remains febrile with a temperature of 39 degree celsius, a pulse rate of 100/minute and a blood pressure controlled at 120/80 mmHg. He has tenderness over his left flank with both kidneys manually palpable. He has no other visceromegaly and has normal bowel sounds. You suspect a urine infection and get the following test results:

| | | |
|---|---|---|
| Hb | 13.4 g/dl | 13-18 g/dl |
| WBC | 14.7 x $10^9$/l | 4-11 x $10^9$/l |
| Platelets | 316 x $10^9$/ | 150-300 x $10^{9/l}$ |
| PT | 12 seconds | 12-14 seconds |
| APTT | 34 seconds | 30-46 seconds |
| Serum Creatinine | 89 mmol/l | 50-120 umol/l |

A 72 year old man with a 12 year history of diabetes being treated with metformin attends as a GP admission, as he is lethargic and the GP is concerned about his persistent hyperkalaemia. His HbA1c 7.5% (<6). He also has a history of hypertension for which he takes bisoprolol 5 mg daily, amlodipine 10 mg/d, simvastatin 40mg/d and aspirin 75 mg/d.

He has been re-referred to clinic by his GP as he has been noted to have a persistent hyperkalaemia. Previously he was taking an ACE inhibitor but this was stopped one year ago.

| | |
|---|---|
| Sodium | 132 mmol/l (134-144) |
| Potassium | 5.8 mmol/l (3.5 – 5) |
| Urea | 8.8 mmol/l (3-8) |
| Creatinine | 100 micromol/l (50-100) |
| Glucose | 14.1 mmol/l (3.5-5.5) |

Which of the following is the likely cause of this man's hyperkalaemia?

- ○ Auto-immune hypoadrenalism
- ○ Bisoprolol
- ○ Chronic renal failure
- ○ Metformin
- ○ Renal artery stenosis

| | |
|---|---|
| Auto-immune hypoadrenalism | 50% |
| Bisoprolol ← Correct answer | 11% |
| Chronic renal failure ✖ | 14% |

Incorrect answer selected

| | |
|---|---|
| Metformin | 8% |
| Renal artery stenosis | 18% |

This patient has a long history of hypertension and hyperkalaemia. He has a mild hyponatraemia associated with the hyperkalaemia and the most likely diagnosis is type 4 renal tubular acidosis or hyporeninaemic hypoaldosteronism. The most likely drug to cause this is the beta blocker and this should be stopped. Other drugs implicated include ACE inhibitors and NSAIDs. At this age and in a patient that does not have other autoimmune disease (T2DM), this is unlikely to be hypoadrenalism

| | | |
|---|---|---|
| APTT | 34 seconds | 30-46 seconds |
| Blood glucose | 7.8 mmol/l | 2.5-7.5 mmol/l |
| Serum Urea | 102 mmol/l | 2.5-6.7 mmol/l |
| Serum Creatinine: | 456 umol/l | 50-120 umol/l |
| Serum Potassium: | 5.3 mmol/l | 3.5-5.0 mmol/l |
| LDH | 2100 iu/l | <300 iu/l |
| Peripheral Film | Fragmented RBCs | |
| ECG | Normal | |

What is the best management strategy for this patient?

- Intravenous antibiotics
- Intravenous bortezomib
- Intravenous calcium gluconate
- Intravenous chloroquine
- Plasmapheresis

A 62 year old lady who received a cadaveric renal transplant 5 months ago presents to Accident and Emergency with a feeling of general malaise and persistent diarrhea. Her current medications include oral prednisolone 7.5 mg OD, tacrolimus 2mg BD, mycophenolate mofetil 500mg BD, carvedilol 6.25mg BD, metformin 500mg BD and aspirin 75mg OD.

On examination, she has a low grade fever and appears icteric and slightly dehydrated with a blood pressure of 134/72 mmHg and pulse of 80 bpm. The rest of the examination is normal. Her laboratory investigations reveal:

| | | |
|---|---|---|
| Hb | 13.5 g/dl | 12-18 g/dl |
| WBC | 7.9 x $10^9$/l | 4-11 x $10^9$/l |
| Platelets | 325 x $10^9$/l | 150-300 x $10^9$/l |
| PT | 12 seconds | 12-14 Seconds |
| APTT | 34 seconds | 30-46 seconds |
| Serum creatinine | 130 umol/l | 50-120 umol/l |
| Urea | 18 mmol/l | 2.5-6.7 mmol/l |
| ALT | 100 iu/l | 5-40 iu/l |
| AST | 111 iu/l | 5-40 iu/l |
| Total bilirubin | 26 umol/l | 2-17 umol/l |
| GGT | 10 u/l | 5-30 u/l |

What is the most likely diagnosis?

- BK virus nephropathy
- Cytomegalovirus disease
- Leptospirosis
- Miliary tuberculosis
- Posttransplant lymphoproliferative

| | | |
|---|---|---|
| Serum Creatinine | 89 mmol/l | 50-120 umol/l |
| S/Urea | 7 mmol/l | 2.5-6.7 mmol/l |
| CRP | 45 mg/l | <5 mg/l |

Urine Analysis:

| | |
|---|---|
| Pus Cells | Numerous |
| Leucocyte Esterase | +++ |
| Blood | ++ |

Which of the group of antibiotics can be started empirically by virtue of excellent cyst penetration?

- Amoxicillin & metronidazole
- Chloramphenicol & cefuroxime
- Ciprofloxacin & co-trimoxazole
- Gentamycin & cefixime
- Vancomycin & linezolid

Acute coronary syndrome 1%

Cerebral salt wasting syndrome 4%

Dialysis disequilibrium syndrome 94%

✔ Correct answer selected

Hemorrhagic stroke 1%

Ischemic stroke 1%

Patients with severe azotemia are recommended to have short, more frequent dialysis sessions with a lower blood flow setting for the first few sessions of hemodialysis. This is to prevent transient osmotic disequilibrium known as “dialysis disequilibrium syndrome”, which may manifest with neurological symptoms like restlessness, headache, twitching, tremors or even seizures as in this case.

Amoxicillin & metronidazole 4%

Chloramphenicol & cefuroxime 5%

Ciprofloxacin & co-trimoxazole 48%

✔ Correct answer selected

Gentamycin & cefixime 37%

Vancomycin & linezolid 5%

Fluoroquinolones and cotrimoxazole are known to cross the cyst membranes. They cover the most commonly encountered bacteria in such scenarios i.e. E.coli, proteus, klebsiella and other enterobacteriaceae species. Cyst aspiration to culture the organism remains gold standard.

Complicated effusion requires 12 F chest drain ← Correct answer — 16%

Complicated effusion requires observation only — 2%

Complicated effusion requires wide bore chest drain — 5%

Empyema requires 12 F chest drain — 43%

Empyema requires wide bore chest drain ✖ Incorrect answer selected — 35%

There is no pus in the fluid so by definition this is not an empyema. As the pH is <7.2, LDH >1000 and glucose is low this is a complicated parapneumonic effusion and BTS guidance recommends drainage with a 12 F chest drain. Note empyemas do not always require a wide bore drain and 12 F chest drains are being increasingly used here.

**Further Reading**

- BTS Pleural Disease Guideline 2010

A 42 year old male with schizophrenia complains of cough and night sweats for 3/52. No improvement was observed after a 1/52 Amoxicillin from the GP so his carers bring him to A&E. Clinical examination is consistent with consolidation and a pleural effusion at the right base. His temperature is 37.4C and his oxygen saturations are 95% on air. CXR confirms right lower and midzone pneumonia with a moderate right pleural effusion. A diagnostic pleural tap was undertaken with blood stained fluid extracted.

Analysis of pleural fluid revealed:

| | |
|---|---|
| pH | 6.9 |
| Glucose | 1.0 mmol/l (Normal >3.4 mmol/l) |
| Protein | 50 g/l (<20) |
| LDH | 5467 iu/l (<100) |

The most likely diagnosis and management is?

- ○ Complicated effusion requires 12 F chest drain
- ○ Complicated effusion requires observation only
- ○ Complicated effusion requires wide bore chest drain
- ○ Empyema requires 12 F chest drain
- ○ Empyema requires wide bore chest drain

StudyPRN

# Acute Medicine SCE Revision Respiratory medicine

Analysis of pleural fluid revealed:

| | |
|---|---|
| pH | 6.9 |
| Glucose | 1.0 mmol/l (Normal >3.4 mmol/l) |
| Protein | 50 g/l (<20) |
| LDH | 5467 iu/l (<100) |

The most likely diagnosis and management is?

Peer responses

Complicated effusion requires 12 F chest drain ← Correct answer — 16%

Complicated effusion requires observation only — 2%

Complicated effusion requires wide bore chest drain — 5%

Empyema requires 12 F chest drain — 43%

Empyema requires wide bore chest drain ✖ Incorrect answer selected — 35%

There is no pus in the fluid so by definition this is not an empyema. As the pH is <7.2, LDH >1000 and glucose is low this is a complicated parapneumonic effusion and BTS guidance recommends drainage with a 12 F chest drain. Note empyemas do not always require a wide bore drain and 12 F chest drains are being increasingly used here.

Large cell lung carcinoma 1%

Small cell lung cancer ✓ 64%

Correct answer selected

Squamous cell lung cancer 21%

Tuberculosis 2%

This patient has symptoms of an underlying lung cancer, supported by the mass on X-ray. His blood picture demonstrates a neuroendocrine syndrome, namely syndrome of inappropriate ADH secretion (SIADH). SIADH is most commonly associated with small cell lung cancer. Squamous cell lung cancer is more commonly associated with hypercalcaemia, whilst adenocarcinoma and large cell carcinoma are not as commonly associated with the neuroendocrine syndromes.

Although TB can present with the symptoms described, given the history and key findings, it is important to exclude a lung cancer first in this patient.

A 71-year-old male presents to his GP with a 3-month history of weight loss, cough and malaise. He has a 50-pack year smoking history. His GP organises a number of investigations including a chest X-ray that shows a left upper lobe mass. Some key blood test results are as follows:

| | |
|---|---|
| Haemoglobin | 14.9 g/dl (12-16) |
| White Blood Count | 6.3 (4-10) |
| Corrected Calcium | 2.58 mmol/l (2.2-2.6) |
| Potassium | 3.1 mmol/l (3.5-5) |
| Sodium | 125 mmol/l (134-144) |

Based on the investigations, what is the most likely diagnosis?

- ○ Adenocarcinoma of the lung
- ○ Large cell lung carcinoma
- ○ Small cell lung cancer
- ○ Squamous cell lung cancer
- ○ Tuberculosis

A 49 year old woman is admitted with a 3 day history of left flank pain, dysuria and fever. She has an 8 year history of type 2 diabetes for which she takes metformin and gliclazide together with Ramipril and simvastatin.

On examination her BMI is 35.3 $kg/m^2$, temperature is 38.5C, pulse 92 bpm and blood pressure 120/80 mmHg. She has oxygen sats of 97% on air and a respiratory rate of 22/min. She has some tenderness on the left flank but no masses are palpable.

Results show:

| | |
|---|---|
| Sodium | 136 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 12.1 mmol/l (3-8) |
| Creatinine | 128 micromol/l (50-100) |
| Haemoglobin | 13.3 g/l (120-160) |
| White cell Count | 12.8 $x10^9$/l (3-10) |
| Platelets | 158 $x10^9$/l (140-450) |
| C-Reactive Protein | 135 mg/dl (<5) |
| Glucose | 12.3 mmol/l |
| HbA1c | 7.8% (<6) |
| Urinalysis | Red cells ++, leucocytes ++ |

Which of the following is the most appropriate treatment for this woman?

- IV amoxicillin
- IV cefuroxime
- Oral co-amoxiclav
- Oral nitrofurantoin
- Oral trimethoprim

Oral amoxicillin 20%

Oral doxycycline ✔ Correct 40%

answer selected

Oral levofloxacin 36%

This patient has a community acquired pneumonia but is allergic to penicillin and therefore, according to guidance, could be treated with oral non-penicillin alternatives such as doxycycline or clarithromycin.

| | |
|---|---|
| Haemoglobin | 13.3 g/l (120-160) |
| White cell Count | $12.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |
| C-Reactive Protein | 55 mg/dl (<5) |

The chest x-ray reveals some haziness at the right base.

Which of the following is the most appropriate treatment for this patient?

- IV cefotaxime
- IV clarithromycin
- Oral amoxicillin
- Oral doxycycline
- Oral levofloxacin

A 73 year old man is admitted to the MAU by his GP with a 5 day history of cough and feeling unwell. He has otherwise been well with no other history of note. His cough is productive of a greenish sputum and he has become increasingly breathless. He is a non-smoker. He informs you that he has a penicillin allergy. Otherwise he does not take any medication.

On examination, he has a BMI of 28.5 kg/m2, a pulse of 82 bpm regular, a blood pressure of 122/88 mmHg and oxygen saturations on air of 95%. His temperature is 38.5C. Auscultation of the heart is normal and examination of the chest reveals some crackles at the right base.

His results reveal:

| | |
|---|---|
| Sodium | 136 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 6.8 mmol/l (3-8) |
| Creatinine | 98 micromol/l (50-100) |
| Haemoglobin | 13.3 g/l (120-160) |
| White cell Count | $12.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |

| | | |
|---|---|---|
| Hb | 11.1 g/dl | 12-18 g/dl |
| WBC | 7.6 x $10^9$/l | 4-11 x $10^9$/l |
| Platelets | 366 x $10^9$/l | 150-300 x $10^9$/l |
| PT | 12 seconds | 12-14 seconds |
| APTT | 34 seconds | 30-46 seconds |
| Serum Creatinine | 892 umol/l | 50-120 umol/l |
| Urea | 135 mmol/l | 2.5-6.7 mmol/l |
| ECG | Unremarkable | |

What is the most likely diagnosis?

- ○ Acute coronary syndrome
- ○ Cerebral salt wasting syndrome
- ○ Dialysis disequilibrium syndrome
- ○ Hemorrhagic stroke
- ○ Ischemic stroke

A 78-year-old lady with COPD is referred to the Rapid Access Chest clinic with a 5-month history of cough and weight loss. A chest X-ray requested by the GP demonstrated a lesion within the left lower lobe. A CT confirmed a likely lung primary with TNM staging T3N2M0 and biopsy shows a non-small cell lung cancer, likely squamous cell. She is referred to the oncologists for consideration of radiotherapy..

Currently, in the UK, what is the 10-year survival for lung cancer?

- 5%
- 10%
- 15%
- 20%
- 25%

Chest drain 1%

Discharge and return in 2-4 weeks ✔ Correct answer selected 61%

Immediate referral to cardiothoracic surgeon 1%

Needle aspiration 36%

**Explanation**

The British Thoracic Society (BTS) definition of a 'large' pneumothorax is a >2 cm measurement from the lung margin to the chest wall at the level of the hilum. This patient has primary spontaneous pneumothorax (PSP), is less than 50 years old and is a non-smoker and there is no evidence of underlying lung disease on examination or chest x-ray. Conservative management is the treatment of choice for a small PSP without significant breathlessness and in the absence of a persistent air leak. The PSP will gradually resolve as air is reabsorbed into the pulmonary capillaries. Patients with a small PSP without breathlessness should be considered for discharge with an early outpatient review in 2-4 weeks. These patients should also receive clear written advice to return in the event of worsening breathlessness. Supplemental high flow oxygen is recommended when patients are admitted for observation.

A 34-year-old man, with no significant past medical history and who is a non-smoker, presents with acute onset chest pain on the right side and is found to have a pneumothorax on chest X-ray. The chest X-ray is otherwise unremarkable. On measurement it is found to be approximately 1 cm from the lung margin to the chest wall at the level of the hilum.

The patient's observations are as follows:

| Test | Result | Normal ranges |
|---|---|---|
| Temperature | 36°C | 36.1°-37.2°C |
| Respiratory rate | 22 breaths/min | 16–20 breaths/min |
| Heart rate | 110 bpm | 50–80 bpm |
| Blood pressure | 110/50 mmHg | 120/80 mmHg |
| Oxygen saturations on air | 98% | 95 to 100% |

What is the next step?

- ○ Admit for 7 days and observe for progression
- ○ Chest drain
- ○ Discharge and return in 2-4 weeks
- ○ Immediate referral to cardiothoracic surgeon
- ○ Needle aspiration

Ufone 8:56 AM 67%
studyprn.com



| | | |
|---|---|---|
| 5% | ✔ Correct answer | 24% |
| 10% selected | ✖ Incorrect answer | 24% |
| 15% | | 20% |
| 20% | | 25% |
| 25% | | 7% |

Currently around 5% of lung cancers are cured, and although the cure rate is slowly improving it lags behind most other common cancers. Outcomes in the UK are worse than in a number of other European countries and North America. The 1-year survival is 30%. An individual's prognosis will depend on a number of variables including stage at diagnosis, histological subtype, comorbidities and performance status at diagnosis (which will also influence management options).

Chronic renal failure 0%

Type-I renal tubular acidosis ✔ 38%

Correct answer selected

Type-II renal tubular acidosis 40%

Type-IV renal tubular acidosis 15%

Ureteric stone 7%

The biochemical picture is consistent with distal renal tubular acidosis (type-I renal tubular acidosis). This includes an acidosis, hypokalaemia, low serum bicarbonate levels and relatively high urinary pH. Urine pH remains >5.5 despite severe acidaemia ([$HCO_3$] <15 mmol/l). Renal stone formation and nephrocalcinosis are common in this condition.

CTPA ✖ Incorrect answer 34%

selected

D-dimer ← Correct answer 50%

Echo 0%

No need for further investigation 14%

as likely viral pleurisy

VQ scan 2%

This patient presents with acute breathlessness and chest pain. She has a tachycardia and her oxygen saturations are low. We are not told whether she has a previous PE/DVT and so must assume that she has not. Therefore, her Well's score here would be 3, as a diagnosis of PE is a distinct possibility here and so the algorithm would suggest the measurement of a D-Dimer in the first instance and if positive to undertake imaging, most probably CTPA. D-dimer will be positive in about 98% of cases of PE and so if negative would suggest the end of the pathway and no further imaging required.

Suspected PE Pathway

| 2 Minute Medicine® @2minmed **Criteria** 2minutemedicine.com | **Points** |
|---|---|
| Active cancer | 1 |
| Bedridden recently >3 days or major surgery within 4 weeks | 1 |
| Calf swelling >3 cm compared to the other leg (measured 10 cm below tibial tuberosity) | 1 |
| Collateral (nonvaricose) superficial veins present | 1 |
| Entire leg swollen | 1 |
| Localized tenderness along deep venous system | 1 |
| Pitting edema, greater in symptomatic leg | 1 |
| Paralysis, paresis, or recent plaster immobilization of the lower extremity | 1 |
| Previously documented DVT | 1 |

Table I. The Wells DVT Criteria. ≥2 indicates that the probability of DVT is likely; <2 indicates that the probability of DVT is unlikely.

Aspergillosis 12%

Community acquired pneumonia 4%

Pneumocystis jiroveci pneumonia ✔ Correct answer selected 77%

Pulmonary tuberculosis 6%

Sarcoidosis 1%

This patient with renal transplantation has now become acutely unwell with fever and chest infection. The timing of an infectious episode after transplantation is crucial in establishing a diagnosis. In the first one month after transplantation, usually infections related to the surgery itself or indwelling catheters like urinary tract infections are common. Whereas the most common time for opportunistic infections to occur secondary to immunosuppression is the 1-6 month period post-transplant, as encountered with this patient. Pneumocystis jiroveci pneumonia (PCP) is an opportunistic chest infection with the patient presenting with nonspecific pneumonic symptoms like cough (often dry), fever, shortness of breath and occasionally hemoptysis. 2 main differentiating points between PCP and community acquired pneumonia remain the chest X ray findings and an elevated LDH in case of PCP. The chest X ray although normal in mild disease usually yields peri-hilar bilateral middle-lower zone infiltrates in PCP. Bronchoalveolar lavage remains the mainstay diagnostic modality with co-trimoxazole being the first line treatment.

**Reference**

| | | |
|---|---|---|
| | | g/dl |
| WBC | 13.6 x $10^9$/l | 4-11 x $10^9$/l |
| Platelets | 133 x $10^9$/l | 150-300 x $10^9$/l |
| PT | 12 seconds | 12-14 seconds |
| APTT | 34 seconds | 30-46 seconds |
| S/Creatinine | 234 micromol/l | 50-120 umol/l |
| S/Urea | 66 mmol/l | 2.5-6.7 mmol/l |
| ALT | 47 iu/l | 5-40 iu/l |
| LDH | 365 iu/l | <300iu/l |
| CXR (PA View) | Bilateral Hilar & Lower Zone Non-Homogenous Opacities | |

What is the most likely diagnosis?

- Aspergillosis
- Community acquired pneumonia
- Pneumocystis jiroveci pneumonia
- Pulmonary tuberculosis
- Sarcoidosis

A 37 year old lady who had a cadaveric renal transplant 5 months ago presents to Accident and Emergency with complaints of fever, dry cough and worsening of shortness of breath over the last 4 days. She is known to have Alport's syndrome and has remained on peritoneal dialysis for 1 year. Her current medications include oral prednisolone, mycophenolate mofetil, tacrolimus, lisinopril and omeprazole.

On examination, she appears short of breath with a respiratory rate of 26/min and an oxygen saturation of 90% on 2 liters of oxygen. Her blood pressure is 140/90 mmHg with a temperature of 38°C. There is no pallor or pedal edema. Her chest auscultation reveals bilateral pan inspiratory coarse crackles. The rest of the examination is unremarkable.

Her investigations reveal:

| | | |
|---|---|---|
| Hb | 12.3 g/dl | 13-18 g/dl |
| WBC | 13.6 x $10^9$/l | 4-11 x $10^9$/l |
| Platelets | 133 x $10^9$/l | 150-300 x $10^9$/l |

Acute respiratory distress syndrome ✔ Correct answer selected — 69%

Hospital acquired pneumonia — 4%

Pulmonary embolism — 10%

Pulmonary haemorrhage — 3%

In the context of sepsis, the most likely explanation of this patient's current condition is ARDS. Although he has received IV fluids as part of his treatment for sepsis, he is only mildly in positive balance and it is likely he was in a profound 'negative balance' on admission; there is no evidence clinically that he is overloaded. Whilst he is at risk of pneumonia, the rapid deterioration chest x-ray findings are more in keeping with ARDS than pneumonia, and a HAP this early on would be unusual.

ARDS is an acute injury to the lungs brought about by a variety of insults, that causes widespread inflammation and impedes gas exchange at the alveolar level.

A 65-year-old man presents to A+E with a 2 day history of fever, lethargy and dysuria. He has become confused in the hours prior to admission and drowsy. He is diagnosed with urinary sepsis with associated acute kidney injury, and he is commenced on appropriate antibiotics and IV fluids.

22 hours after admission he becomes increasingly breathless as reviewed by the oncall team.

He is only managing to complete short sentences. He has dry mucous membranes. His respiratory rate is 30, heart rate is 121bpm, BP is 105/64, oxygen saturations are 92% on 15L. Examination shows normal JVP and normal heart sounds. Auscultation reveals fine crackles bilaterally. There is no peripheral oedema and his calves are soft and non-tender. He is passing urine and is 400ml positive balance since admission.

A chest x-ray demonstrated bilateral infiltrates.

A blood gas is also performed on 15L (via non-rebreather mask).

| | |
|---|---|
| **pH** | 7.32 |
| **pCO2** | 3.8 kPa |
| **pO2** | 8.1 kPa |
| **HCO3** | 18.7mmol/l |

What is the most likely explanation for his deterioration?

- ○ Acute pulmonary oedema
- ○ Acute respiratory distress syndrome
- ○ Hospital acquired pneumonia
- ○ Pulmonary embolism
- ○ Pulmonary haemorrhage

A 42 year old woman presents acutely complaining of a left sided pleuritic chest pain of 4 hours duration and a painful cough. She had a recent upper respiratory tract infection having had a cough and sniffles for 3-4 days. In her past, she was diagnosed with ulcerative colitis maintained in remission on mesalazine. She is a non-smoker.

On examination, her pulse is 110 bpm, blood pressure 100/60 mmHg, respiratory rate 22/min with oxygen saturations of 94% on room air. Her temperature is 37.2C and her chest is clear.

Investigations reveal:

| | |
|---|---|
| **FBC** | Normal |
| **CRP** | 20 mg/dl (<5) |
| **U+E** | Normal |
| **ECG** | Normal |

Which of the following is the most appropriate next investigation for this patient?

- ○ CTPA
- ○ D-dimer
- ○ Echo
- ○ No need for further investigation as likely viral pleurisy
- ○ VQ scan

inflammation and impedes gas exchange at the alveolar level.

Direct pulmonary causes include inhalation of gastric contents (pH <2), infective (pneumonia, etc), pulmonary trauma, near-drowning, toxic gas inhalation and oxygen toxicity.

Indirect causes include sepsis, non-thoracic trauma, uraemia, bowel infarction, anaphylaxis and burns.

The diagnostic criteria include:

- An acute lung injury - within one week of the insult
- Bilateral infiltrates on a chest x-ray, not explained by other lung pathology
- Respiratory failure not explained by fluid overload
- A Decreased PaO2/FiO2 ratio

ARDS mortality is generally high (40%), but is determined by the cause with aspiration pneumonia having a mortality rate of almost 80% when associated with ARDS.

**Reference:**

A 35-year-old woman has a history of recurrent urinary tract infections. She attends accident and emergency with severe left sided flank pain. Dipstick urine shows blood 2+ protein 1+.

Bloods show:

| | | **Normal ranges** |
|---|---|---|
| **Sodium** | 137 mmol/L | 137–144 mmol/L |
| **Potassium** | 2.3 mmol/L | 3.5–4.9 mmol/L |
| **Bicarbonate** | 13 mmol/L | 20–28 mmol/L |
| **Chloride** | 116 mmol/L | 95–107 mmol/L |
| **Urea** | 3.6 mmol/L | 2.5–7.0 mmol/L |
| **Urinary pH** | 6.6 | |

Which one of the following is the most probable diagnosis in this case?

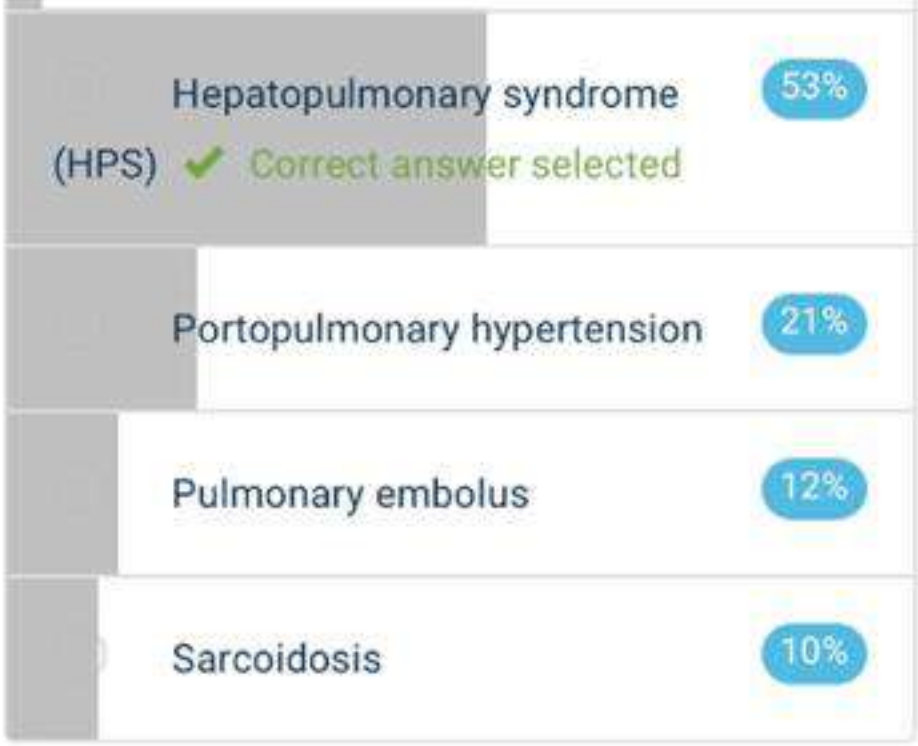
- ○ Chronic renal failure
- ○ Type-I renal tubular acidosis
- ○ Type-II renal tubular acidosis
- ○ Type-IV renal tubular acidosis
- ○ Ureteric stone

A 55-year-old Afro-Caribbean woman with cryptogenic cirrhosis notes progressive exertional dyspnea, despite being fully compliant with a salt-restricted diet and a high-dose diuretic medication regimen.

Her saturations are 92% while sitting and 88% when standing. The results of her cardiac and respiratory system examinations are normal, she has minimal ascites and trace ankle edema, and her weight has been stable over the past several months.

Which of the following is the most likely diagnosis?

- Hepatic hydrothorax
- Hepatopulmonary syndrome (HPS)
- Portopulmonary hypertension
- Pulmonary embolus
- Sarcoidosis




Cirrhotic patients are at increased risk of specific abnormalities of pulmonary mechanics, haemodynamics, and ventilation-perfusion matching that can adversely affect both quality of life and longevity. Two of the most common pulmonary manifestations of cirrhosis are alterations in lung mechanics caused by the presence of ascites and intrapulmonary shunting and abnormal gas exchange, which together constitute HPS. HPS is defined as a widened age-corrected alveolar-arterial oxygen gradient (AaPO2) of room air in the presence or absence of hypoxemia (AaPO2 >15 mm Hg or >20 mm Hg in patients older than 64 years of age) as a result of intrapulmonary vasodilation.

Classic clinical manifestations of HPS include platypnea (dyspnea worsened by an erect position and improved by a supine position), orthodeoxia (exacerbation of hypoxia and hypoxemia in the upright position), an insidious onset and slow progression of dyspnea, clubbing, and distal cyanosis.

The diagnosis of HPS requires a high degree of clinical suspicion, measurement of arterial blood gases, detection of intrapulmonary shunting, and exclusion of intrinsic cardiopulmonary disease as the cause of hypoxemia.

The most sensitive test for the diagnosis of intrapulmonary shunting is contrast echocardiography. Treatment options for HPS are limited. Patients with well-preserved hepatic synthetic function who have hypoxemia are generally treated symptomatically until oxygenation worsens sufficiently to permit listing for liver transplantation.

A 39 year old man attends A&E with supraventricular tachycardia. He has never had it before, but feels well other than having severe palpitations. His ECG confirms SVT at a rate of 190 bpm. His only medical history is that of asthma, which has required intensive care admission in the past.

After chemically cardioverting him with adenosine he develops bronchospasm, and becomes very wheezy.

Which of the following is an indicator of life threatening asthma?

- Heart rate <110 bpm
- Inability to complete sentences in one breath
- Normal $PaCO_2$
- PEF 33-50% predicted
- Respiratory rate <25

A 35-year-old patient with known well-controlled atopic asthma presents to the emergency department with an acute asthma attack. She had been over at her friend's house (who owns a cat) and about 15 minutes later she felt wheezy and breathless. She decided to go to A+E.

On examination she is clearly breathless but able to converse in short sentences. She has a heart rate of 113bpm, BP 121/76mmHg, Saturations 95% on air, temperature 37.1°C. Auscultation reveals widespread wheeze throughout both lung fields. Her Peak flow is 280 (her best peak flow is 400).

What is the most appropriate initial management of this patient?

- ○ Salbutamol and atrovent nebuliser, amoxicillin and 40mg prednisolone
- ○ Salbutamol and atrovent nebuliser and 40mg prednisolone
- ○ Salbutamol and atrovent nebuliser, 200mg hydrocortisone
- ○ Salbutamol and atrovent nebuliser, 30mg prednisolone and 4g magnesium sulphate
- ○ Salbutamol nebuliser, amoxicillin and 40mg prednisolone

threatening asthma?

Peer responses

- Heart rate <110 bpm — 1%
- Inability to complete sentences in one breath — 24%
- Normal PaCO2 ✔ Correct answer selected — 67%
- PEF 33-50% predicted — 6%
- Respiratory rate <25 — 2%

Hyperventilation in asthma should cause a low PaCO2 as CO2 is ‘blown off’. A normal CO2 in an unwell asthmatic suggests that the ventilator exchange mechanisms are beginning to fail. All the other answers are markers of acute severe asthma.

A 68-year-old man with a 60 pack year history presents with cough and haemoptysis. A chest X-ray shows a right hilar mass. Bronchoscopy is undertaken and biopsy confirms the diagnosis of carcinoma of bronchus. His calcium levels are 3.49 mmol/l (2.2-2.5) with a raised PTHrp concentration.

What is the most likely histological subtype for this carcinoma?

- Adenocarcinoma
- Alveolar-cell carcinoma
- Fibrosarcoma
- Small cell carcinoma
- Squamous cell carcinoma

Salbutamol and atrovent nebuliser and 40mg prednisolone ✔ Correct answer selected — 57%

Salbutamol and atrovent nebuliser, 200mg hydrocortisone — 33%

Salbutamol and atrovent nebuliser, 30mg prednisolone and 4g magnesium sulphate — 7%

Salbutamol nebuliser, amoxicillin and 40mg prednisolone — 2%

This patient has an acute exacerbation of her asthma. As such, the initial management should include nebulised bronchodilators (salbutamol and atrovent) and steroids. Oral steroids are as effective as intravenous delivery, provided the patient can take oral medication. There is no evidence of infection, so antibiotics are not warranted. This patient does not require IV magnesium sulphate as yet, and this should be reserved if she does not respond to initial treatment.

A 62 year old man is admitted to MAU by his GP with a 5 day history of productive cough and feeling unwell. He has no other medical history of note. His cough is productive of a greenish sputum and he has become increasingly breathless. He is an ex-smoker, having stopped 10 years ago. He takes no medication.

On examination, he appears unwell, has a BMI of 28.5 kg/m2, a pulse of 90 bpm regular, a blood pressure of 124/68 mmHg and oxygen saturations on air of 94%. His temperature is 38.8C and his respiratory rate is 30. Auscultation of the heart is normal and examination of the chest reveals some crackles at the right base.

His results reveal:

| | |
|---|---|
| Sodium | 136 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 8.6 mmol/l (3-8) |
| Creatinine | 110 micromol/l (50-100) |
| Haemoglobin | 13.5 g/l (120-160) |
| White cell Count | $14.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |
| C-Reactive Protein | 128 mg/dl (<5) |

The chest x-ray reveals haziness at the right base.

Which of the following is the most appropriate treatment for this patient?

- IV amoxicillin plus IV clarithromycin
- IV ciprofloxacin
- IV levofloxacin
- Oral amoxicillin plus clarithromycin
- Oral co-trimoxazole

| | | |
|---|---|---|
| ○ | Adenocarcinoma | 5% |
| ○ | Alveolar-cell carcinoma | 0% |
| ○ | Fibrosarcoma | 0% |
| ○ | Small cell carcinoma | 25% |
| ○ | Squamous cell carcinoma ✔ | 69% |

Correct answer selected

Hypercalcaemia and elevated parathyroid hormone related peptide levels are most commonly associated with squamous cell carcinoma. Small cell carcinoma and cancers with bone metastases may be also be associated with hypercalcaemia but not with increased PTHrH levels.

| | |
|---|---|
| **Platelet** | 150 x109/L (140-400) |
| **Sodium** | 132 mmol/L (134-144) |
| **Potassium** | 3.8 mmol/L (3.4-5) |
| **Urea** | 7.9 mmol/L (3-8) |
| **Creatinine** | 83 micromol/L (50-100) |

What is the most appropriate management of this patient?

- ○ Departmental thoracic ultrasound and marking for diagnostic aspiration
- ○ Departmental thoracic ultrasound and marking for thoracocentesis
- ○ Intercostal chest drain insertion
- ○ Referral to pleural clinic to be seen as an urgent out-patient
- ○ Referral to respiratory team as in-patient

A 68-year-old lady presents to the acute medical unit via her GP on a Friday evening with a 2-week history of increasing breathlessness on exertion. She has a past medical history of breast cancer, radically treated 8 years ago, and hypertension. She is an ex-smoker, with a 20-pack year history, She reports a dry cough and a reduction in her exercise tolerance. She now describes being breathless walking up 1 flight of stairs.

On examination, she appears comfortable at rest, her oxygen saturations are 98% on air and her respiratory rate is 19/min. Her pulse is 88bpm and blood pressure 150/88 mmHg. Examination of her cardiovascular system is entirely normal with no peripheral oedema. Auscultation of her chest reveals reduced air entry at the right base. A chest-xray shows a moderate right-sided effusion.

Her blood results are as below:

| | |
|---|---|
| **Hb** | 11.5 g/dl (12-16) |
| **MCV** | 91 fL (85-95) |
| **WBC** | 9.6 x 109/L (3-10) |
| **Platelet** | 150 x109/L (140-400) |
| **Sodium** | 132 mmol/L (134-144) |

A 66-year-old lady has recently been diagnosed with adenocarcinoma and is being discussed at the regional MDT regarding treatment options. Her CT showed a T2, N1, M0 tumour in the right upper lobe, which was confirmed on PET CT. She is otherwise fit and well, with a performance status of 1.

Which of the following would be the most appropriate initial choice of treatment for this patient?

- Chemotherapy
- Lobectomy
- Pneumonectomy
- Radiotherapy
- Wedge resection

Departmental thoracic ultrasound and marking for diagnostic aspiration ✖ Incorrect answer selected — 55%

Departmental thoracic ultrasound and marking for thoracocentesis — 14%

Intercostal chest drain insertion — 3%

Referral to pleural clinic to be seen as an urgent out-patient ← Correct answer — 11%

Referral to respiratory team as in-patient — 16%

Although symptomatic, this lady is currently stable. There is nothing in the examination to suggest that this lady requires urgent out-of-hours' intervention, and departmental ultrasound marking is not recommended. A chest drain should not be the initial management of choice, and a therapeutic aspiration (with real time bedside ultrasound), with samples sent for diagnostic purposes, is appropriate. As this patient is unlikely to be seen until Monday by the respiratory team, and is stable, she can be managed as an urgent out-patient in the appropriate pleural clinic.

A 62 year old man is admitted to MAU by his GP with a 5 day history of productive cough and feeling unwell. He has no other medical history of note. His cough is productive of a greenish sputum and he has become increasingly breathless. He is an ex-smoker having stopped 10 years ago. He takes no medication.

On examination, he appears unwell, has a BMI of 28.5 kg/m2, a pulse of 90 bpm regular, a blood pressure of 124/68 mmHg and oxygen saturations on air of 94%. His temperature is 38.8C and his respiratory rate is 30. Auscultation of the heart is normal and examination of the chest reveals some crackles at the right base.

His results reveal:

| | |
|---|---|
| Sodium | 136 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 8.6 mmol/l (3-8) |
| Creatinine | 110 micromol/l (50-100) |
| Haemoglobin | 13.5 g/l (120-160) |
| White cell Count | $14.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |
| C-Reactive Protein | 128 mg/dl (<5) |

The chest x-ray reveals haziness at the right base.

What is the CURB-65 score in this patient?

- 0
- 1
- 2
- 3
- 4

Chemotherapy 13%

Lobectomy ✔ Correct answer 64%

selected

Pneumonectomy 14%

Radiotherapy 6%

Wedge resection 4%

NICE guidance is that patients with NSCLC who are medically fit and suitable for treatment with curative intent should be offered lobectomy as first choice treatment. Those of borderline fitness and small tumours can be considered for lung parenchymal sparing resections (such as wedge resection) if complete resection can be achieved

| | | |
|---|---|---|
| Amoxicillin and Clarithromycin | | 4% |
| Co-Trimoxazole | | 19% |
| Doxycycline | | 0% |
| Rifampicin, Isoniazid, Ethambutol and Pyrazinamide ✔ answer selected | Correct | 70% |
| Tazocin | | 6% |

This gentleman has miliary TB. Anti-TNF agents can cause relapses of previously dormant or unknown TB, and these often present as miliary TB due to the immunosuppressive effects of infliximab. All patients should be screened for TB vaccination prior to treatment, but sometimes this is missed, especially in emergencies. a such the correct treatment here is for TB.

0 — 0%

1 — 5%

2 ← Correct answer — 90%

3 ✖ Incorrect answer selected — 4%

4 — 0%

The CURB-65 score is a score used in community acquired pneumonia with prognostic value. His CURB65 score can be calculated as follows:

| | |
|---|---|
| Confusion | 0 |
| Urea >7 | 1 |
| Respiratory rate >30 | 1 |
| BP Systolic <90, Diastolic <60 | 0 |
| 65 years of age or above | 0 |

Discharge and continue follow up with respiratory team 43%

Discharge and treat with course of oral antibiotics 2%

Request CTPA 12%

Request D-dimer ✔ Correct answer selected 41%

Request dopplers of the leg veins 3%

It is likely that this patient is breathless as a consequence of her morbid obesity with probable asthma and quite an element of psychological overlay. However, in view of the fact that she was admitted to hospital just 3 weeks ago and is obese requires the exclusion of PE. Therefore, the most appropriate approach would be to initially check a D-dimer concentration and if this were normal then no further investigation would be required. That the patient had a CTPA previously would be somewhat irrelevant as venous thromboembolism could have occurred at home and, in view of her co-morbidities she would be considered a higher risk. However her Wells score is less than 4 and with a negative d-dimer PE would be very unlikely, hence CTPA not required.

underpenetrated. Arterial gases show:

| | |
|---|---|
| pH | 7.37 (7.34-7.44) |
| pO2 | 10.2 kPa (11-13) |
| PCO2 | 4 kPa (4.5-6) |

Which of the following is the most appropriate management strategy for this patient?

- Discharge and continue follow up with respiratory team
- Discharge and treat with course of oral antibiotics
- Request CTPA
- Request D-dimer
- Request dopplers of the leg veins

A 64 year old woman is admitted with shortness of breath of 8 hours' duration. She was admitted to hospital 3 weeks ago with the same problem. She became breathless over a period of a few days and when admitted on the last occasion you see from the portal that she had a CTPA which was normal and was diagnosed with asthma. After being treated with inhalers she was discharged. Her Peak Flow rate was 260 l/min. She has an appointment for the respiratory physicians in about 2 weeks but on this occasion felt she needed to be admitted.

On this occasion, she describes this problem with breathlessness which has deteriorated over the last 24 hours. She has had an unproductive cough. She becomes increasingly breathless on any exertion and has found it particularly difficult to get round the house. She is rather tearful and is under a lot of pressure at home as her granddaughter lies with her and is 'playing her up'. She is unaware of any chest pain. On the background history, she is obese and has type 2 diabetes.

On examination, her pulse is 98 bpm, oxygen saturations are 96% on air, temperature is 37C, respiratory rate is 25/min and her blood pressure is 120/88 mmHg. She appears dyspnoeic at rest and has a peak flow of 260 which improves to 340 following nebulised salbutamol. She is obese with a BMI of 42 kg/m2. Auscultation of the chest is normal with no audible wheeze. There is no ankle oedema and the calves are soft and non-tender.

Investigations show normal FBC, U+Es and a CRP of 20 mg/dl. Chest x-ray is normal although slightly underpenetrated. Arterial gases show:

| | |
|---|---|
| pH | 7.27 (7.34-7.44) |

Observation only 0%

Refer to cardio-thoracic surgeons 0%

Simple aspiration ✔ Correct 66%

answer selected

BTS guidelines for a primary pneumothorax as in this case (young age, no smoking history, no chronic lung disease) recommend simple aspiration in the first instance up to 2.5 L. If this is successful and the pneumothorax becomes less than 2 cm at the level of the hilum and symptomatically better they can be potentially discharged and reviewed in 2-4 weeks in respiratory outpatients. If aspiration fails chest drain is likely to be required.

A 31 year old male, normally fit and well, who has never smoked, presents with sudden onset pleuritic chest pain and shortness of breath. CXR reveals a large left sided pneumothorax (4 cm at the level of the hilum). Oxygen saturations are 95% on air.

Which of the following is the most appropriate next step in his management according to British Thoracic Society Guidelines?

- Chest drain insertion
- High flow oxygen
- Observation only
- Refer to cardio-thoracic surgeons
- Simple aspiration

A 72-year-old man presents to accident and emergency with a 12-hour history of breathlessness. He also reports some loose stools. He is a current smoker with a 62-pack year history.

On examination he is dyspnoeic, has a pulse of 117 bpm, a respiratory rate of 27 with oxygen saturations of 88% on air. He has a temperature of 38.6°C. Auscultation of his chest reveals crackles and reduced air entry at the right base. His abdomen is also distended with dullness in the flanks.

Investigations are as follows:

| | |
|---|---|
| **Hb** | 10.2 g/dl (12-16) |
| **MCV** | 104 fL (85-95) |
| **WBC** | 13.6 x 109/L (3-10) |
| **Platelet** | 85 x109/L (140-400) |
| **AST** | 82 U/L (0-50) |
| **ALP** | 330U/L (50-110) |
| **Gamma GT** | 820U/L (0-50) |
| **Sodium** | 132 mmol/L (134-144) |
| **Potassium** | 3.3 mmol/L (3.4-5) |

Immediate IV amoxicillin/clarithromycin ✔ Correct

63%

answer selected

Immediate dose oral cotrimoxazole

0%

IV bolus bicarbonate

0%

IV bolus hydrocortisone

1%

## Explanation

NICE guidelines recommend that all patients aged 12 years and over who have suspected sepsis and 1 or more high risk criteria should receive an immediate senior review and a broad-spectrum antimicrobial at the maximum recommended dose without delay (within 1 hour of identifying that they meet any high risk criteria in an acute hospital setting)'.

## References

| | | |
|---|---|---|
| A | Aspiration pneumonia ✔ | 18% |
| | Correct answer selected | |
| B | E. Coli pneumonia | 10% |
| C | Klebsiella pneumonia | 19% |
| D | Mycoplasma pneumonia | 42% |
| E | Streptococcus pneumonia | 11% |

This gentleman is very likely to abuse alcohol and have alcoholic liver disease (thrombocytopenia, raised MCV, deranged clotting and deranged LFTs). There is also evidence of ascites on examination. This, combined with the timing of his presentation, suggests that he was very intoxicated, likely ended up on the floor (note the raised CK) and has aspirated. The location of the pneumonia would also be in keeping with an aspiration.

| | |
|---|---|
| **Sodium** | 132 mmol/L (134-144) |
| **Potassium** | 3.3 mmol/L (3.4-5) |
| **Urea** | 7.9 mmol/L (3-8) |
| **Creatinine** | 74 micromol/L (50-100) |
| **INR** | 1.5 |
| **CK** | 800U/L (50-250) |
| **Chest X-ray** | Right lower lobe consolidation |

What is the most likely diagnosis?

- ○ Aspiration pneumonia
- ○ E. Coli pneumonia
- ○ Klebsiella pneumonia
- ○ Mycoplasma pneumonia
- ○ Streptococcus pneumonia

A 45 year old man is admitted with a 3 week history of dry cough, breathlessness and weight loss. He has otherwise been fit and well and has no other medical history of note. He takes no medication and is a non-smoker. He has become increasingly dyspnoeic and has occasional episodes where he becomes particularly breathless and panicky. He has lost approximately 3kg in weight over this time.

On examination, he has a BMI of 28kg/m2, his pulse is 100 bpm, blood pressure 118/86 mmHg and his temperature is 38C. His oxygen sats are 92% on air. Examination of the chest reveals some scattered wheeze but little else. The calves are soft and non-tender.

Investigations reveal:

| | |
|---|---|
| Haemoglobin | 141 g/l (12-16) |
| White cell count | $17x10^9$/l (2-10 |
| Platelets | $188x10^9$/l (140-450) |
| U+Es | Normal |
| C-reactive protein | 36 mg/l (<5) |
| pH | 7.42 (7.35-7.45) |
| P02 | 10.1 (10.5-14) |
| PCO2 | 4.0 (4.5-6) |
| ECG | Normal |
| CXR | Normal |

Which of the following is the most likely diagnosis?

- ○ Asthma
- ○ Atypical pneumonia
- ○ Community acquired pneumonia
- ○ Multifocal bronchioalveolar carcinoma
- ○ Pulmonary emboli

A 38 year old Asian man is admitted with shortness of breath. He has a background of ulcerative colitis and recently had a moderately severe flare during which he was commenced on 2 weekly infusions of Infliximab. Over the last 48 hours he has become increasingly unwell with cough and fever. His other medication includes Mesalazine 4.8g daily. He has no known allergies He is otherwise fit and well.

His observations are as follows:

HR 105 bpm

BP 108/64 mmHg

RR 23/min

Temp 36.9C

On examination there are bilateral crackles throughout the chest.

His chest radiograph shows widespread small nodular opacities distributed throughout the lung.

What is the best antibiotic(s) to commence in this gentleman?

- ○ Amoxicillin and Clarithromycin
- ○ Co-Trimoxazole
- ○ Doxycycline
- ○ Rifampicin, Isoniazid, Ethambutol and Pyrazinamide
- ○ Tazocin

A 30-year-old woman with no past medical history was admitted with fever, breathlessness and a productive cough. She was not taking any regular medication and was not pregnant.

At presentation she had a blood pressure of 80/50 mmHg and was given 2 litres of rapid intravenous saline. Her vital signs were recorded again and were as follows:

| Test | Result | Normal ranges |
|---|---|---|
| Temperature | 38°C | 36.1°-37.2°C |
| Respiratory rate | 26 breaths/min | 16–20 breaths/min |
| Heart rate | 110 bpm | 50–80 bpm |
| Blood pressure | 80/50 mmHg | 120/80 mmHg |
| Oxygen saturations on air | 92% | 95 to 100% |
| Venous blood gas lactate | 5 mmol/l | (0.5-1 mmol/l) |

She is also confused. According to NICE guidelines, what should happen next?

- ○ Arrange urgent ITU admission
- ○ Immediate IV amoxicillin/clarithromycin
- ○ Immediate dose oral cotrimoxazole
- ○ IV bolus bicarbonate
- ○ IV bolus hydrocortisone

IV amoxicillin plus IV clarithromycin — 52%

IV ciprofloxacin — 0%

IV levofloxacin — 1%

Oral amoxicillin plus clarithromycin ✔ Correct answer selected — 46%

Oral co-trimoxazole — 1%

This man has a CURB-65 score of 2, suggesting moderately severe pneumonia, and requires admission and treatment with oral amoxicillin plus clarithromycin. IV treatment with benzylpenicillin/amoxicillin plus clarithromycin can be used in subjects who are unable to take oral treatment. There is no indication here that the patient is unable to take oral medication.

Asthma 9%

Atypical pneumonia ✖ 38%

Incorrect answer selected

Community acquired pneumonia 3%

Multifocal bronchioalveolar carcinoma 22%

Pulmonary emboli ← Correct answer 27%

In this scenario of a young man, otherwise well with a month long history of breathlessness, which appears episodic, and weight loss with reduced oxygen saturations, a lowish CRP and hypoxia on blood gas analysis, one needs to exclude multiple pulmonary embolism. In this case pneumonia is a possibility as is asthma yet the absence of any changes on CXR would argue against the former and the 'sudden' development of asthma in a young man with no other atopy would be unusual for the latter. Mild pyrexia, elevated WCC and wheeze/cough are not uncommon presenting features in PE and this needs exclusion. Similarly modestly elevated CRP is more in keeping with PE as CRP>100 is typical of pneumonias. CTPA would be the appropriate investigation here as missing the diagnosis may be fatal.

PE fever and high CRP

Discharge and arrange outpatient lung studies and OP respiratory review — 23%

Discharge with arrangement for OP respiratory review — 10%

Remain as an inpatient and organise a CTPA ✔ Correct answer selected — 59%

Remain as an inpatient, organise lung function studies and chest and abdo CT — 7%

Remain as an inpatient and organise muscle studies — 1%

One must consider PE on this case even from the original admission. Subsegmental PEs can cause these symptoms of cough, wheeze and weight loss. These nagging symptoms lasting weeks are well reported. Whilst one could be forgiven for making the original diagnosis of pneumonia, the fact that he didn't really improve remaining breathless and then suddenly becoming particularly hypoxic should point towards a diagnosis of PEs. This patient should remain as an inpatient, treat with treatment dose LMWH prior to having a CTPA.

- Pulmonary embolism emedicine

A 45 year old man was admitted with chest tightness and cough of approximately 6 weeks' duration. He denied any fever but had on occasions produced greenish sputum. He had seen his GP two weeks previously and was treated with amoxicillin but his cough had not really improved and the evening of his admission he became particularly and suddenly breathless.

On admission, he was found to have a temperature of 38.3C, a pulse of 100 bpm and sats of 94% on room air. He had a respiratory rate of 22/min and scattered wheezes on chest examination. Of note, his white cell count was 9 (3-10), CRP was 44 mg/dl, arterial PO2 was noted to be 10.3kPa (10.5-14) and PCO2 3.8kPa (4.5-6) and chest x-ray revealed no consolidation. ECG was normal. He was treated for a community acquired pneumonia with IV augmentin and oral clarithromycin. He received prophylactic low molecular weight heparin according to the hospital protocol.

Within 6 hours his temperature had subsided but he still felt rather breathless.

The following day he was reviewed by the respiratory consultant who noted a family history of asthma with his son using an inhaler.

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0 4%

1 ✔ Correct answer selected 40%

2 23%

3 10%

The PESI score is not appropriate in this scenario 24%

The PESI score is the Pulmonary Embolism Severity Index and reflects prognosis and therefore ability to treat PE as an outpatient. The score is illustrated in the following table and, as you can see, our patient scores 1 for heart rate greater than 110. A score of 1 and above reflects a 30 day mortality rate of 11% vs 0 of 1%.

Next Exit

Observations were stable but he was found to have an audible wheeze again and was diagnosed with adult onset asthma. He was treated with nebulised salbutamol and prednisolone 30mg daily. 9pm the following night, the patient becomes acutely unwell. He is seen by the duty F2. He describes acute breathlessness and is dyspnoeic. He is tachycardic and has a pulse of 105 bpm although had inhaled salbutamol an hour previously. His oxygen saturations are 92%, his temperature is 36.7C and his blood pressure is 1228/70 mmHg. His ECG was normal. His peak flow was 390.

Investigations at this stage reveal:

| | |
|---|---|
| Chest x-ray | Normal |
| pO2 | 8.3 kPa |
| PCO2 | 3.3 kPa |

He settles down with further nebulisers and his Peak flow is 550.

He is seen the following morning where his breathlessness has improved, though he remains slightly dyspnoeic, he is apyrexial and his peak flow is 550. He is now keen to go home.

Which of the following is the appropriate management for this patient?

- ○ Discharge and arrange outpatient lung studies and OP respiratory review
- ○ Discharge with arrangement for OP respiratory review
- ○ Remain as an inpatient and organise a CTPA
- ○ Remain as an inpatient, organise lung function studies and chest and abdo CT
- ○ Remain as an inpatient and organise muscle studies

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A 25 year old lady who is 28 weeks' pregnant presents with acute onset of breathlessness and a central chest pain. She presents to the medical emergency admissions on a Friday evening. There is no other past history of note and she is gravida 2, para 1. On examination, heart rate is 85 bpm, blood pressure is 115/70 mmHg, respiratory rate is 16/min and oxygen saturations are 98% on air. There is no clinical evidence of deep vein thrombosis. You are clinically suspicious of a pulmonary embolism. Her PESI score is 25 – signifying her age.

Which of the following is the most appropriate management for this patient?

- Admit and prescribe low molecular weight heparin with a view to VQ scan on Monday
- Admit and treat with apixaban until a CTPA on Monday
- Base treatment decisions on a D-dimer measurement
- Discharge with treatment dose low molecular weight heparin over weekend and arrange for VQ Monday
- Request a CTPA that evening for definitive management

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- Base treatment decisions on a D-dimer measurement
- Discharge with treatment dose low molecular weight heparin over weekend and arrange for VQ Monday
- Request a CTPA that evening for definitive management

A 43 year old female presents with sudden onset of chest tightness and dyspnoea. She has a recent diagnosis of lymphoma for which she is under the care of the haematologists. On examination, she is comfortable at rest, has a pulse of 100 bpm regular, a blood pressure of 110/80 mmHg and oxygen saturations of 88% on room air. The Ventilation-Perfusion scan reveals a number of mismatched defects in the chest. Which of the following is the most appropriate initial treatment for this patient?

- Aspirin
- Low molecular weight heparin
- Thrombolysis
- Unfractionated heparin
- Warfarin

A 19-year-old man presents to hospital with a 1-day history of left sided pleuritic chest pain. He feels a little breathless. He smokes 15 cigarettes per day and admits to some cannabis use. He has no past medical history of note.

On examination he looks comfortable. He is approximately 1.90m tall and has a BMI of 19 $kg/m^2$. He is not dyspnoeic. Examination of his chest is unremarkable except for a clicking sound heard in association with the heart sounds.

Chest x-ray is unremarkable.

Given the most likely diagnosis, which of the following initial investigations may help with diagnosis?

- ○ CT thorax
- ○ Echocardiogram
- ○ ECG
- ○ Expiratory chest X-ray
- ○ Lateral decubitus chest x-ray

A 29-year-old female is admitted with a severe exacerbation of her asthma, and requires a 2-day stay in hospital. On discharge she is seen by a specialist asthma nurse and provided with a personalised asthma plan.

Regarding asthma management plans, which patients should receive one?

- ○ All asthma patients
- ○ Patients on step 2 or more
- ○ Patients under secondary care for their asthma
- ○ Patients who have attended A+E on at least 2 occasions
- ○ Patients who have been admitted to hospital with an exacerbation

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# Acute Medicine SCE Revision Other

Course overview Start

| | |
|---|---|
| Haemoglobin | 13.3 g/l (120-160) |
| White cell Count | $12.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |
| C-Reactive Protein | 55 mg/dl (<5) |

The chest x-ray reveals haziness at the right base.

Which of the following is the most appropriate approach to the management of this patient?

- ○ Admit to hospital and treat with IV amoxicillin
- ○ Admit to hospital and treat with IV amoxicillin and oral clarithromycin
- ○ Admit to hospital and treat with oral amoxicillin 500 mg tds
- ○ Discharge home and advise paracetamol
- ○ Discharge home with oral amoxicillin

| | | |
|---|---|---|
| ○ | 0.5 mg adrenaline IV | 3% |
| ○ | 0.5 mg adrenaline IM ✔ Correct answer selected | 87% |
| ○ | 10mg chlorpheniramine IM | 4% |
| ○ | 100mg hydrocortisone IV | 7% |
| ○ | 40mg oral prednisolone | 0% |

This patient has developed angioedema, urticarial and breathing difficulties typical of anaphylaxis. The patient should be treated with 0.5 mg IM adrenaline as the initial treatment as per the resuscitation council guidelines. Other treatments include IM/IV hydrocortisone and IM chlorpheniramine but the IM adrenaline and fluids is the initial treatment. The use of IV adrenaline is reserved for severe cases in whom expert understanding of IV adrenaline is understood.

**Reference**

oral amoxicillin 500 mg tds

Discharge home and advise paracetamol — 0%

Discharge home with oral amoxicillin ✔ Correct answer selected — 66%

This patient has a community acquired pneumonia. The important calculation here is the CURB-65 score which has prognostic significance. His CURB65 score is 1 and is calculated as follows:

| | |
|---|---|
| Confusion | 0 |
| Urea >7 | 0 |
| Respiratory rate >30 | 0 |
| BP Systolic <90, Diastolic <60 | 0 |
| 65 years or above | 1 |

Under these circumstances, the guidance with a CURB-65 of 0-1 suggests that the patient can be managed at home with oral amoxicillin.

- BTS Guidance for community acquired

A 64-year-old woman presents with several episodes of hematemesis and a few days' history of melena. She denies any history of alcohol abuse but has been taking ibuprofen for pain in her knees for the last few weeks. Her haemoglobin has dropped by about 3.5 gm/l over the last few days. She is advised to stay overnight for blood transfusion and an urgent upper GI endoscopy the following morning. However, the patient refuses to receive treatment or be admitted as she does not like hospitals. She is not confused and is deemed to have capacity. There is no history of mental disorder.

Her obs are as follows:

| Test | Result | Normal ranges |
|---|---|---|
| Temperature | 36°C | 36.1–37.2°C |
| Respiratory rate | 18 breaths/min | 16–20 breaths/minute |
| Heart rate | 110 bpm | 50–80 bpm |
| Blood pressure | 110/50 mmHg | 120/80 mmHg |
| Oxygen saturations on air | 96% | 95 to 100% |

What would be the most appropriate course of action?

- Call a psychiatric liaison nurse for an urgent review
- Detain the patient under 'Deprivation of Liberty' order
- Detain the patient under the Mental Health Act
- Offer patient acute medication with a discharge summary and arrange early outpatient follow-up
- Let patient leave the hospital (ask her to sign the 'discharge against medical advice' form)

known allergen for patient (minutes to several hours):

a. Infants and children: low systolic blood pressure (age specific) or >30% decrease
b. Adults: systolic blood pressure of <90 mmHg or >30% decrease from person's baseline.

Patients at risk of anaphylaxis should be prescribed an adrenaline auto-injector (such as an epipen) to carry with them at all times, in case of an emergency.

**If in doubt it is best to assume anaphylaxis and to treat as an emergency with IM adrenaline.**

Child suffering from an anaphylactic reaction showing pronounced oedema round the eyes and lips and hives to the face and upper abdomen.

Further Reading:

NHS Choices (2014) Anaphylaxis

Suggested points for reflection:

1. What differentiates anaphylaxis from an allergic reaction?
2. What is urticaria?
3. What investigations may be useful in

Which of the following scenarios is most likely to be an anaphylactic reaction?

- An itchy urticarial rash with lip swelling associated with normal blood pressure and normal respiration - onset 5 days ago.
- An urticarial rash with wheeze and low blood pressure - onset 15 minutes ago.
- Persistent low blood pressure with normal skin and mucosal appearance and normal respiration - onset 2 weeks ago.
- Respiratory wheeze with high blood pressure and normal skin and mucosal appearance - onset 10 days ago.
- Vomiting and diarrhoea with low blood pressure and normal skin/mucosal appearance and respiration - onset 3 days ago.

A 62-year-old man is admitted after having had a seizure. He has had numerous admissions related to alcohol abuse, is generally non-compliant with therapy and has a history of alcohol-related seizures. He is under the care of the alcohol and drugs psychiatry team and they tried to help the patient withdraw from alcohol 8 weeks ago. However, he continues to drink heavily. A+E have found nothing abnormal on physical examination but he is confused. He has received a thiamine infusion, is on an alcohol withdrawal regime and a CT head scan was normal. On review by medicine, he is insistent that he wants to go home. On questioning, he informs you of his address but when asked where he is, he tells you that this is an antique shop and had no idea of the date. He says he has shopping to take home (there is a bag by his side which contains slippers) and wants to discharge himself against medical advice. There are no family members nor does he have any carers. He lives alone and has done so for many years, as you understand from his records. You indicate that you would like him to stay to complete the thiamine infusions. He remains insistent that he is leaving. He has a GCS of 14 (confused) but otherwise entirely normal observations.

for him to be reviewed at home by the liaison psychiatric services

Institute a deprivation of liberty safeguard ← Correct answer 35%

Temporarily section patient under section 4 of the mental health act and then get this supported by psychiatric team 55%

✖ Incorrect answer selected

**Explanation:**

This patient clearly lacks the capacity to make an informed decision regarding his discharge and his safety is paramount. In the first instance, the most appropriate approach relating to his ongoing management is for him to have an urgent deprivation of liberty safeguard (DOLS), so that the patient can be treated, including any reversible causes of his confusion, which in this case may well be withdrawal. Sectioning the patient is unnecessary in this scenario as DOLS would provide the best approach and enable the patient to leave should his confusion subside.

An urticarial rash with wheeze and low blood pressure - onset 15 minutes ago. ✔ Correct answer selected — 97%

Persistent low blood pressure with normal skin and mucosal appearance and normal respiration - onset 2 weeks ago. — 0%

Respiratory wheeze with high blood pressure and normal skin and mucosal appearance - onset 10 days ago. — 1%

Vomiting and diarrhoea with low blood pressure and normal skin/mucosal appearance and respiration - onset 3 days ago. — 0%

Anaphylaxis is highly likely when any one of the following three criteria are met:

1. Acute onset of an illness (this means minutes to several hours) with skin and/or mucosal tissue involvement PLUS at least one of:
    a. respiratory compromise
    b. reduced blood pressure
2. Acute onset (minutes to several hours) after exposure to a known allergen for the patient of two or more of the following: skin or mucosal tissue involvement, respiratory compromise, reduced blood pressure or associated symptoms and persistent gastrointestinal symptoms.
3. Reduced blood pressure after exposure to known allergen for patient (minutes to several hours):
    a. Infants and children: low systolic blood pressure (age specific) or >30% decrease
    b. Adults: systolic blood pressure of <90 mmHg or >30% decrease from person's baseline.

(confused) but otherwise entirely normal observations.

Which of the following is the most appropriate approach to the management of this man?

- Allow him to discharge himself against medical advice
- Arrange transfer to psychiatric unit and formal psych assessment utilising a temporary section
- Discharge the patient and arrange for him to be reviewed at home by the liaison psychiatric services
- Institute a deprivation of liberty safeguard
- Temporarily section patient under section 4 of the mental health act and then get this supported by psychiatric team

Detain the patient under ‘Deprivation of Liberty’ order — 4%

Detain the patient under the Mental Health Act — 5%

Offer patient acute medication with a discharge summary and arrange early outpatient follow-up ✔ Correct answer selected — 49%

Let patient leave the hospital (ask her to sign the ‘discharge against medical advice’ form) — 40%

**Explanation**

According to law, if a patient is deemed to have mental capacity he or she can refuse treatment. In order to minimise risk to the patient it is wise to offer acute medications and arrange an early outpatient follow-up.

StudyPRN

# Acute Medicine SCE Revision Other

Question ID #3771

An 18 year old female is admitted as an emergency with acute facial swelling and difficulty breathing. She is not known to have any allergy but does suffer from mild asthma for which she occasionally uses a salbutamol inhaler. She was out having a picnic with her friends, eating various foods, when she suddenly became unwell, feeling particularly anxious and itchy, while developing facial/mouth swelling with difficulty breathing. Her friends called 999.

On examination, she has swelling of the face particularly around the eyes and lips. There are wheals around the neck. Pulse is 100 bpm and blood pressure 128/80 mmHg. She has an audible wheeze and oxygen saturations are 96% on air.

Which of the following is the most appropriate treatment for this patient?

- 0.5 mg adrenaline IV
- 0.5 mg adrenaline IM
- 10mg chlorpheniramine IM
- 100mg hydrocortisone IV
- 40mg oral prednisolone

A 21 year old male presents with a long history of weakness, muscle cramps and ease of fatigue. He denied use of any illicit substances and was otherwise fine. His mother had type 2 diabetes and he had two other brothers who were well. There was little of note on examination, his BMI was 29 $kg/m^2$ and the following results were obtained:

| | |
|---|---|
| **U+Es** | Normal |
| **AST** | 94 iu/l (5 - 40) |
| **ALT** | 90 iu/l (5 - 40) |
| **Alkaline phosphatase** | 88 ui/l (50 - 110) |
| **Bilirubin** | 12 micromol/l (0 - 18) |
| **CPK** | 1020 iu/l (30 - 220) |
| **LDH** | 300 iu/l (90 - 250) |
| **Calcium** | 2.4 mmol/l (2.2 - 2.6) |
| **Antibody screen** | Negative |
| **FBC** | Normal |
| **ESR** | 10 mm/hr (0 - 15) |

Which of the following is the most likely diagnosis?

- Becker's muscular dystrophy
- McArdle's disease
- Non-alcoholic steatohepatosis
- Thyrotoxic periodic paralysis
- Vitimin D Deficiency

answer selected

- Patients on step 2 or more — 8%
- Patients under secondary care for their asthma — 2%
- Patients who have attended A+E on at least 2 occasions — 5%
- Patients who have been admitted to hospital with an exacerbation — 18%

The BTS/Sign Guidelines (2016) recommend that all patients with asthma receive an individualised asthma management plan. The lack of asthma management plans was highlighted in the recent National Review into Asthma Deaths. Prior to discharge, following an asthma presentation, all patients should have inhaler technique and compliance checked, be provided with an asthma management plan (if they do not already have one), see their GP within 1 week and have specialist asthma follow up arranged (either clinician or specialist asthma nurse).

A 73 year old man is admitted to MAU by the GP with a 5 day history of cough and feeling unwell. He has otherwise been well with no other history of note. His cough is productive of a greenish sputum and he has become increasingly breathless. He is a non-smoker.

On examination, he has a BMI of 28.5 kg/m2, a pulse of 82 bpm regular, a blood pressure of 122/88 mmHg and oxygen saturations on air of 95%. His temperature is 38.5C and he has a respiratory rate of 26/min. Auscultation of the heart is normal and examination of the chest reveals some crackles at the right base.

His results reveal:

| | |
|---|---|
| Sodium | 136 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 6.8 mmol/l (3-8) |
| Creatinine | 98 micromol/l (50-100) |
| Haemoglobin | 13.3 g/l (120-160) |
| White cell Count | $12.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |

| | | |
|---|---|---|
| ○ | Aspirin | 0% |
| ✔ | Low molecular weight heparin<br>Correct answer selected | 95% |
| ○ | Thrombolysis | 0% |
| ○ | Unfractionated heparin | 4% |
| ○ | Warfarin | 0% |

This patient has had multiple pulmonary emboli on the basis of her presentation and confirmatory VQ scan. Low molecular weight heparin would be the recommended initial treatment for this patient. The patient is not shocked or severely distressed by a large PE that would warrant thrombolysis.

- Admit and prescribe low molecular weight heparin with a view to VQ scan on Monday ← Correct answer — 39%
- Admit and treat with apixaban until a CTPA on Monday — 2%
- Base treatment decisions on a D-dimer measurement — 5%
- Discharge with treatment dose low molecular weight heparin over weekend and arrange for VQ Monday ✖ Incorrect answer selected — 33%
- Request a CTPA that evening for definitive management — 21%

This patient is pregnant and whilst the PESI score is low, guidance suggests that this patient should be admitted and treated with low molecular weight heparin until a definitive investigation (VQ) can be arranged. All trials associated with PESI scores do not include pregnant women and hence there is no evidence for ambulatory management in such patients. Were this patient not to be pregnant then ambulatory management would be entirely appropriate. D-dimer is highly likely to be elevated in pregnancy and so is irrelevant in decision making.

Hestia Criteria

CT thorax 16%

Echocardiogram 27%

ECG 3%

Expiratory chest X-ray ✖ 33%

Incorrect answer selected

Lateral decubitus chest x-ray ← 21%

Correct answer

A synchronous click with the heart sounds is associated with small apical (left) pneumothorax, which can be missed on a traditional PA film. He is tall and in addition smokes – both known to be risk factors for developing pneumothorax.

Lateral decubitus chest x-rays may provide additional information, but expiratory chest x-ray is of little benefit. CT thorax should not be an initial investigation.

A 40 year old woman is admitted with acute central chest pain and breathlessness. She has no past medical history of note but has been on the OCP. CTPA confirms a diagnosis of pulmonary embolism. On examination she has a heart rate of 112 bpm, a blood pressure of 106/60 mmHg, a respiratory rate of 22/min, sats of 94% on room air, a temperature of 37.2C and her GCS is 15/15.

Which of the following reflects her simplified PESI score?

- 0
- 1
- 2
- 3
- The PESI score is not appropriate in this scenario

Ufone 12:02 PM 55%
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A 45 year old woman with a history of depression is admitted after taking an overdose of citalopram together with consuming alcohol in a suicide attempt. Her relatives state that following an argument she went off and was found in the local park some 4 hours later, inebriated, having taken about 30x40mg citalopram tablets. On examination, she had a temperature of 39.5C, a pulse of 110 bpm reg and a blood pressure of 100/60 mmHg. She is agitated with a GCS of 15. ECG reveals a sinus tachycardia. The patient is treated with activated charcoal and IV fluids.

Which of the following is the most appropriate approach to the management of this patient?

- IV diazepam
- IV glucagon
- IV insulin/glucose
- IV metoprolol
- Supportive therapy only required

A 17-year-old boy presents to A&E with a minor sporting injury. However, he is noted to have a blood pressure reading of 180/110 mmHg. He is admitted and his blood pressure does not settle below 160/90 mmHg. His dad says there is a family history of high blood pressure and strokes on his father's side.

Clinical examination is unremarkable.

| Test | Result | Normal ranges |
|---|---|---|
| Sodium | 144 mmol/L | 133 - 146 |
| Potassium | 3.1 mmol/L | 3.5 - 5.3 |
| Urea | 5 mmol/L | 2.5 - 7.8 |
| Creatinine | 80 umol | 50 - 90 |
| Venous bicarbonate | 31 mEq/L | 22 to 28 |

What is the most likely diagnosis?

- ○ Coarctation of the aorta
- ○ Cushing's syndrome
- ○ Phaeochromocytoma
- ○ Primary hyperaldosteronism
- ○ Renovascular disease

IV diazepam ✔ Correct answer 41%
selected

IV glucagon 5%

IV insulin/glucose 2%

IV metoprolol 4%

Supportive therapy only required 49%

SSRI overdose is quite common and usually safe, though citalopram is an exception as it may prolong the QT interval. Serotonin syndrome may develop and is associated with symptoms of anxiety, agitation, tachycardia, seizures and hyperthermia. In this case, the patient has taken a high dose of citalopram and is agitated. She has been given activated charcoal and the appropriate treatment for the agitation, which may prevent the development of seizures, is IV diazepam. Oral cyproheptadine is also an agent that has been used with some success in the treatment of SSRI overdose.

Cushing's syndrome 4%

Phaeochromocytoma 2%

Primary hyperaldosteronism ✔ 86%

Correct answer selected

Renovascular disease 5%

**Explanation**

In primary aldosteronism (PA), there is excess aldosterone production, which is autonomous, causing excessive sodium reabsorption within the distal nephron. It leads to hypertension and suppression of the renin-angiotensin II system, which means patients will have high aldosterone and low renin levels. Plasma aldosterone/plasma renin activity ratio is a useful screening test.

Severe urinary loss of potassium and hydrogen ions, exchanged for sodium at the distal nephron, may result in hypokalaemia and metabolic alkalosis. However, not all patients will have all metabolic abnormalities.

A 78-year-old lady presents to the MAU with atrial fibrillation with a fast ventricular rate. Her medical history includes hypertension, for which she takes Ramipril 2.5mg. You commence her on a Beta-blocker for rate control, and discuss the option of commencing anticoagulant therapy for stroke prevention. She is concerned about the risk of bleeding.

Which of the following scoring systems could you use to help evaluate this patient's risk of major haemorrhage

- CHADS VASC SCORE
- CHADS VASC 2 SCORE
- GLASGOW BLATCHFORD SCORE
- HASBLED SCORE
- ROCKALL SCORE

GLASGOW BLATCHFORD SCORE 0%

HASBLED SCORE ✔ Correct answer selected 85%

ROCKALL SCORE 5%

The HASBLED score will calculate the risk of major haemorrhage in 1 year in patients with atrial fibrillation. CHADS VASC and CHADS VASC 2 are used to evaluate risk of thrombotic stroke in atrial fibrillation. GBS and Rockall scores are used in GI bleeding.

| | Condition | Points |
|---|---|---|
| H | Hypertension: (uncontrolled, >160 mmHg systolic) | 1 |
| A | Abnormal renal function: Dialysis, transplant, Cr >2.26 mg/dL or >200 µmol/L Abnormal liver function: Cirrhosis or Bilirubin >2x Normal or AST/ALT/AP >3x Normal | 1 |
| S | Stroke: Prior history of stroke | 1 |
| B | Bleeding: Prior Major Bleeding or Predisposition to Bleeding | 1 |
| L | Labile INR: (Unstable/high INRs), Time in Therapeutic Range <60% | 1 |
| E | Elderly: Age > 65 years | 1 |
| B | Prior Alcohol or Drug Usage History (> 8 drinks/week) Medication Usage Predisposing to Bleeding: (Antiplatelet agents, NSAIDs) | 1 |

A 36-year-old male is referred in by the GP after presenting with headaches which have deteriorated over the last 2 weeks. He is found to have a high blood pressure of 220/120 mmHg and is admitted as an emergency. There is nothing particularly of note in his history. He is a non-smoker and drinks little alcohol. He does not take any drugs and denies illicit substance abuse.

On examination he has a BMI of 30.3 kg/m$^2$, a blood pressure of 224/122 mmHg and a pulse of 88 bpm. Examination of his fundi reveal some flame shaped haemorrhages. His ECG reveals left ventricular hypertrophy and urinalysis is negative.

Tests reveal:

| Test | Result | Normal range |
|---|---|---|
| Sodium | 141 mmol/l | 134-144 |
| Potassium | 3.5 mmol/l | 3.5-5 |
| Urea | 9.2 mmol/l | 3-8 |
| Creatinine | 110 micromol/l | 50-100 |

Which of the following is the most appropriate approach to the management of this patient?

- ○ IV labetalol
- ○ IV furosemide
- ○ Oral amlodipine
- ○ Oral ramipril
- ○ Sublingual nifedipine

Peer responses

| | |
|---|---|
| IV labetalol ✔ Correct answer selected | 73% |
| IV furosemide | 0% |
| Oral amlodipine | 18% |
| Oral ramipril | 9% |
| Sublingual nifedipine | 0% |

Severe hypertension is classified as a systolic above 180 and a diastolic above 110 mmHg. Hypertensive crisis is associated with severe hypertension in the presence of end organ damage such as retinopathy; flame shaped haemorrhages and papilloedema; hypertensive encephalopathy; acute coronary syndrome; pulmonary oedema. This requires urgent treatment with the aim of reducing blood pressure by roughly 20-25%. IV drugs such as labetalol, nitroprusside (unlicensed), nicardipine and hydralazine can be used. In those with severe hypertension but lacking end organ damage, this is termed hypertensive urgency and oral antihypertensives can be employed.

Whilst nitroprusside is a potential answer here, it is not licensed for this use, is difficult to accurately titrate being very short acting, needs HDU monitoring, and with renal or hepatic failure can be associated with thiocyanate toxicity. Labetalol is the better answer.

A 46 year old man is admitted complaining of acute onset of palpitations. He has no other history of note and takes no medication. He denies the use of illicit drugs but drinks about 20 units of alcohol weekly. He does not smoke. He was playing golf this morning when he became slightly short of breath upon climbing a hill and was aware of palpitations. He denies being aware of palpitations before. He finished playing but the fast heart rate persisted and he has been aware of this for roughly 2-3 hours. On examination, he appears well with a pulse of 140 bpm irregular, blood pressure 116/76 mmHg. His BMI is 27.3 $kg/m^2$, clinically he is euthyroid. CVS examination is otherwise normal. His ECG reveals him to be in atrial fibrillation and chest x-ray is normal.

Which of the following is the most appropriate initial approach to managing this patient?

- IV digoxin
- IV metoprolol
- Oral bisoprolol
- Oral dronedarone
- Oral flecainide

Peer responses

| | |
|---|---|
| IV digoxin | 0% |
| IV metoprolol | 7% |
| Oral bisoprolol | 20% |
| Oral dronedarone | 5% |
| Oral flecainide ✔ Correct answer selected | 67% |

As this is an acute onset AF, a rhythm control strategy should be adopted. The patient is stable and does not require an immediate DCCV. According to NICE guidelines If pharmacological cardioversion has been agreed on clinical and resource grounds for new-onset atrial fibrillation, offer a choice of flecainide or amiodarone to people with no evidence of structural or ischaemic heart disease or amiodarone to people with evidence of structural heart disease.

A 50 year old man is admitted with an episode of palpitations. He is known to suffer from paroxysmal atrial fibrillation and is being treated with bisoprolol 5mg daily. This is the second occasion over the last 6 months that he has been admitted with palpitations. The ECG confirms atrial fibrillation at a rate of 96 bpm. He has a 3 year history of hypertension and diabetes for which he is treated with metformin and amlodipine. His blood pressure is 124/80 mmHg. Previous investigations reported on clinical portal reveal a normal echo. Within an hour he reverts back to sinus rhythm.

Which of the following approaches would you take regarding long term anticoagulation/antiplatelet therapy?

- ○ No requirement for anticoagulation/antiplatelet therapy
- ○ Treat with aspirin
- ○ Treat with clopidogrel
- ○ Treat with dipyridamole
- ○ Treat with warfarin

A 56 year old woman has a confirmed diagnosis of type 2 diabetes for which she is prescribed metformin, losartan, atenolol and simvastatin. She is also noted to be particularly depressed and is commenced of fluoxetine.

Three months later, she had gone to see her GP recently as part of her diabetes review and complained that she felt more unwell, feeling lethargic and achey. Her GP measured some blood tests found that her HbA1c was excellent at 60 mmol/mol yet requested admission as he found that her sodium was 125 mmol/l (134-144)

Which of the following would be the most likely to cause of this problem?

- Atenolol
- Fluoxetine
- Metformin
- Losartan
- Simvastatin

A 21 year old male student is brought to A+E by his friends who have been increasingly concerned about him as he took a hallucinogenic substance the day before and had a 'bad trip'. Since then, he has become confused and drowsy. They do not know what substance he took but informs you that he has taken recreational drugs before.

On examination he is drowsy with a GCS of 12, blood pressure of 112/72 mmHg and a pulse of 110 bpm. He also has a liver flap. His oxygen saturations are 99% on air. There are no specific abnormalities on neurological examination.

His blood results reveal:

| | |
|---|---|
| FBC | Normal |
| U+Es | Normal |
| CRP | 55 mg/l (<5) |
| Bilirubin | 50 micromole/l (0-18) |
| Alkaline Phosphatase | 250 IU/l (50-110) |
| AST | 1500 IU/l (10-50) |
| ALT/td> | 1500 IU/l (10-500 |

Which of the following is the likely cause for his presentation?

- ○ Amphetamines
- ○ Cocaine
- ○ Ecstasy (MDMA)
- ○ Ketamine
- ○ Psychedelic mushrooms

A 54 year old male with a recent history of hypertension and type 2 is admitted with marked muscle pains and tiredness which have developed over the last one month and have become more profound over the last week.

He is currently taking aspirin, metformin, simvastatin, losartan, omeprazole and amlodipine as regular therapies.

Which of the following is most likely to have caused his presentation?

- Amlodipine
- Losartan
- Metformin
- Omeprazole
- Simvastatin

- Losartan 0%
- Metformin 0%
- Omeprazole 1%
- Simvastatin ✔ Correct answer 99%

selected

The presentation is suggestive of a statin-induced myositis. This occurs in approximately 5% of those treated with statins and usually presents with vague muscle aches and pains. CPK is often elevated and the patients respond to withdrawal of the offending drug. Myositis is also associated with fibrates and can be exacerbated with the concomitant use of a statin and fibrate. Alternative agents to treat hyperlipidaemia, such as ezetimibe, could be used.

Grade 0 0%

Grade 1 8%

Grade 2 ← Correct answer 59%

Grade 3 32%

Grade 4 ✖ Incorrect answer 0%

selected

This correlates as moderate encephalopathy. It is important to recognize encephalopathy and its severity as it is largely a clinical diagnosis, and prompt treatment is appropriate. The West Haven Encephalopathy grading system is the most common tool used to grade the severity of encephalopathy and it is summarized in the list below;

- Grade 0 - minimal HE – difficult to diagnose clinically
- Grade 1 -Mild HE - Trivial lack of awareness; euphoria or anxiety; shortened attention span; impaired performance of addition or subtraction
- Grade 2 - Moderate HE - Lethargy or apathy; minimal disorientation for time or place; subtle personality change; inappropriate behavior
- Grade 3 - Severe HE- Somnolence to semi stupor, but responsive to verbal stimuli; confusion; gross disorientation
- Grade 4 - Coma

| | |
|---|---|
| No requirement for anticoagulation/antiplatelet therapy | 3% |
| Treat with aspirin | 9% |
| Treat with clopidogrel | 1% |
| Treat with dipyridamole | 0% |
| Treat with warfarin ✔ Correct answer selected | 86% |

This man has a CHADS-VASC score of 2 based on his age<65 (0) plus diabetes and hypertension (1 each). This, in conjunction with paroxysmal atrial fibrillation, puts him at risk of stroke/TIA and therefore anticoagulation is the most appropriate approach – either with warfarin or the newer antithrombotics – dabigatran, apixaban and rivaroxaban.

SIGN Guidance

# Acute Medicine SCE Revision Clinical pharmacology & poisoning

Question ID #3550

A 65 year-old man presents with a three year history of erectile dysfunction. His libido is unimpaired but he has been unable to have intercourse with his wife for some months, which they both find distressing. His GP prescribed him sildenafil. However, he is admitted as an emergency after developing profound weakness and giddiness an hour or so after having had the sildenafil. He is noted to be hypotensive at 70/50 mmHg.

Which of the following concomitant therapies is likely to have precipitated this effect with sildenafil?

- Amlodipine
- Atenolol
- Irbesartan
- Nicorandil
- Verapamil

Amlodipine 16%

Atenolol 3%

Irbesartan 4%

Nicorandil ✔ Correct answer selected 70%

Verapamil 7%

Sildenafil is a phosphodiesterase-5 (PDE-5) inhibitor, drugs that are well known to interact with nitrates, resulting in dramatic hypotension. Nicorandil will also produce this reaction. These drugs should not, therefore, be used in patients who also use a GTN spray.

A 45 year old woman with a history of depression is admitted after taking an overdose of atenolol. She had taken approximately 40x50mg tablets 2 hours earlier. On examination, she had a blood pressure of 86 mmHg systolic and a pulse of 48 bpm regular. Her ECG revealed a sinus bradycardia without clear p waves. Her GCS was 13.

She is administered IV fluids but which of the following should initially be given to this patient?

- IM adrenaline
- IV adrenaline
- IV dobutamine
- IV glucagon
- IV hydrocortisone

| | | |
|---|---|---|
| ○ | IM adrenaline | 1% |
| ○ | IV adrenaline | 4% |
| ○ | IV dobutamine | 1% |
| | IV glucagon ✔ Correct answer selected | 94% |
| ○ | IV hydrocortisone | 0% |

This woman has taken a life threatening overdose of beta-blockers and is critically ill. She requires immediate transfer to ICU; the most appropriate initial treatment for a beta-blocker overdose would be IV glucagon. Other approaches to treatment include dialysis in atenolol overdose as well as High Dose Insulin Infusion. Similarly, once the airway is secure, one could also use activated charcoal.

An 83 year old lady is admitted from home as she has been more breathless of late. She lives alone and usually manages well. She was seen by her daughter who felt she was more breathless than usual as she has a background of COPD associated with smoking. The GP decided to admit her. She used inhalers and took zopiclone at night to help her sleep. Other than some mild memory problems she had little else of note in her history. She did not drink any alcohol but smoked about 5 cigarettes daily.

On examination she seemed fine, her temperature was 37C, pulse 80 bpm reg and blood pressure 110/80 mmHg. Her oxygen saturations were 94% on air. Other than occasional wheeze there was nothing else of note on examination. Full blood count, U+Es were normal and her CRP was 15 mg/l (<5). She was given oral antibiotics by the night team and was to be reviewed by the consultant the following morning.

The following morning she was agitated, aggressive and would not let anyone perform any observations. She would lock herself in the toilet and felt that people were intent on harming her. She was walking around the unit quite unperturbed and did not otherwise seem distressed but would not permit any medical staff to go near her nor would she listen to what they were saying.

Which of the following is the most appropriate approach to the management of this patient?

- ○ Give chlorpromazine IV/IM
- ○ Give diazepam IV/IM
- ○ Give haloperidol IV/IM
- ○ Give lorazepam IV/IM
- ○ Move to a side room on a ward and just observe

| | |
|---|---|
| Give diazepam IV/IM | 1% |
| Give haloperidol IV/IM ✔ Correct answer selected | 56% |
| Give lorazepam IV/IM | 10% |
| Move to a side room on a ward and just observe | 32% |

This patient is acutely agitated, is likely to have mild dementia and may be delirious. It is therefore, important to assess the patient properly and for their own safety as well as staff safety, the patient should receive sedation. The most appropriate is a typical antipsychotic such as haloperidol. Benzodiazepines are not recommended in the elderly other than for delirium tremens as they are more respiratory sedatory.

Sedation would then enable this patient to be evaluated appropriately for delirium or any other cause of her agitation. In this case, the mild dementia, change of environment, possible use/dependence on zopiclone as well as infection

A 67 year old lady who was recently treated for atrial fibrillation with warfarin according to INR and digoxin 250 µg daily three weeks ago, attends clinic for follow up regarding her SLE. She has been taking Hydroxychloroquine 400 mg for 5 days per week for the last 10 years and she has not seen the opticians for many years. She tells you that she is feeling generally unwell with visual disturbance in that she is now seeing in "yellow". Examination reveals normal visual fields and she was able to count fingers easily at the bedside.

Her recent investigations are:

| | | |
|---|---|---|
| **ESR** | 20 mm/hr | (<40mm/hr) |
| **CRP** | 10 mg/L | (< 10 mg/L) |
| **C3** | 0.45 iU/ml | (0.75 - 1.61 g/L) |
| **C4** | 0.25 iU/ml | (0.16 - 0.47 g/L) |
| **dsDNA (ELISA method)** | 17 iU/ml | (<20 iU/ml) |

What is the most likely explanation for her symptoms?

- ○ Cataracts
- ○ Digoxin toxicity
- ○ Hydroxychloroquine maculopathy
- ○ Occipital infarct
- ○ Retinal haemorrhage

Digoxin toxicity ✔ Correct answer selected — 63%

Hydroxychloroquine maculopathy — 32%

Occipital infarct — 0%

Retinal haemorrhage — 3%

This patient has been given digoxin for atrial fibrillation rate control, and has now become digoxin toxic with the classic symptom of yellow vision (xanthopsia). Other symptoms of digoxin toxicity include weakness, fatigue, dizziness, arrythmia and is exacerbated by hypokalaemia. The unusual dosing regime of hydroxychloroquine was only given as a distractor. Hydroxychloroquine maculopathy usually presents with deterioration of visual acuity and there is an obvious "bulls eye" macular lesion. In end stage maculopathy there is severe atrophy of the retinal pigment epithelium. Maculopathy is dose dependent and duration of treatment dependent. Corneal deposits can occur with hydroxychloroquine but bear no dose or time relationship and disappear on cessation of the drug.

A 35 year old woman presents to the A+E as she has become pathetically tired. The GP hasn't done anything about her problems. She has been treated with thyroxine 100 micrograms for the last 5 years for hypothyroidism and all previous TFTs have been normal. She informs you that she is compliant in taking her thyroxine. On this occasion her thyroid function tests reveal:

| | |
|---|---|
| **Free T4** | 8.8 pmol/l (9-23) |
| **TSH** | 12.2 mu/l (0.5-5) |

Which of the following drugs that she is taking is likely to have contributed to the adverse change in thyroid function test results?

- ○ Aspirin
- ○ Evening primrose oil
- ○ Ferrous sulphate
- ○ Fluoxetine
- ○ St John's wort

| | | |
|---|---|---|
| | Aspirin | 2% |
| | Evening primrose oil | 8% |
| answer | Ferrous sulphate ← Correct | 21% |
| | Fluoxetine | 16% |
| answer selected | St John's wort ✖ Incorrect | 53% |

This patient has had stable thyroid function on 100 micrograms of thyroxine but her most recent TFTs reveal that the dose is now inadequate. Of the drugs listed, the use of ferrous sulphate may be responsible for reduced absorption of thyroxine through chelation of thyroxine in the stomach. It is important to remind patients to take their thyroxine 2 hours before taking ferrous sulphate.

Ufone 1:16 AM 88%
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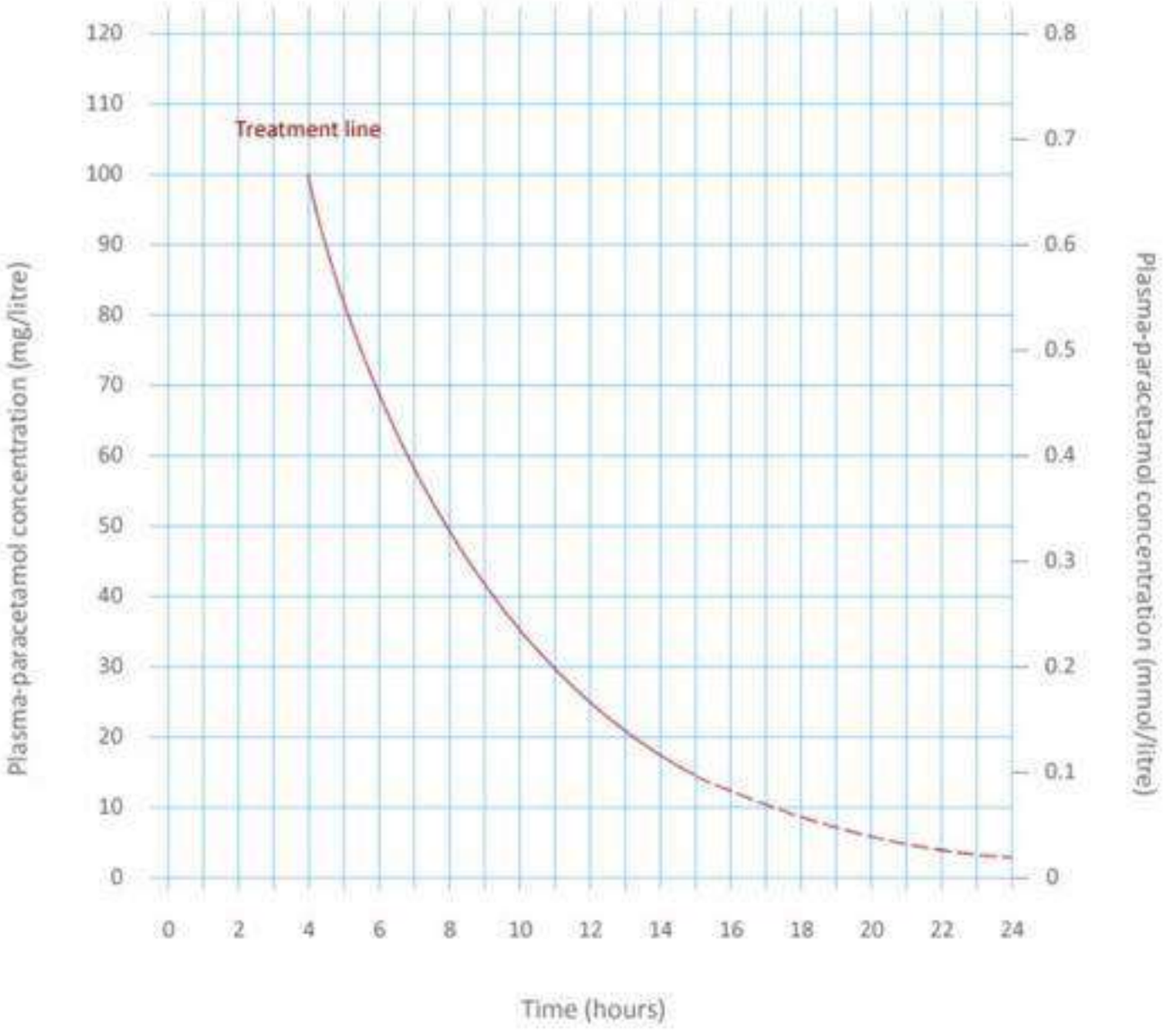
A 30 year old woman is admitted after being found at home by her friends intoxicated and having taken a paracetamol overdose. She had consumed a bottle of vodka and taken a couple of boxes of paracetamol, possibly 30-40 tablets, approximately 4-8 hours earlier. On examination she was stuporous with otherwise normal observations. Her results were normal and her paracetamol level was 100mg/l.

The paracetamol nomogram is shown below.



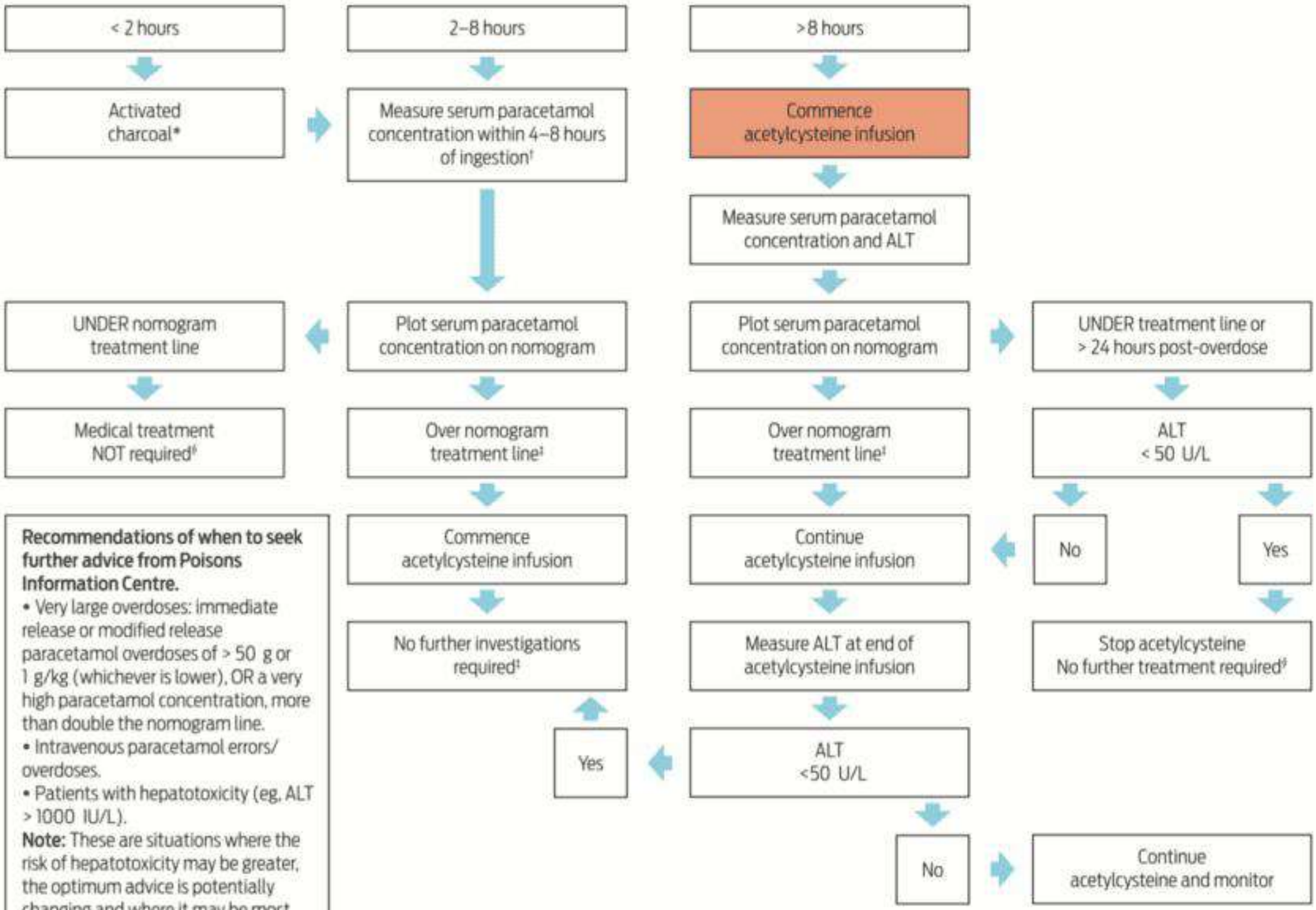

Which of the following is the most appropriate approach for the initial management of this patient?

- ○ Activated charcoal
- ○ IV acetylcysteine
- ○ No treatment required
- ○ Oral acetylcysteine
- ○ Oral methionine

| | | |
|---|---|---|
| ○ | Activated charcoal | 2% |
| ● | IV acetylcysteine ✔ Correct answer selected | 97% |
| ○ | No treatment required | 1% |
| ○ | Oral acetylcysteine | 0% |
| ○ | Oral methionine | 0% |

This patient has a paracetamol concentration which is above the paracetamol nomogram for treatment. She has also consumed the overdose with alcohol, which may act as an enzyme inducer. She is stuporous and therefore cannot have oral acetylcysteine/methionine, which is also an option for treatment and, therefore, should receive IV acetylcysteine.

## 2 Management flow chart for acute paracetamol exposure with known time of ingestion




**NOTE:**
*Cooperative adult patients who have potentially ingested greater than 10 g or 200 mg/kg, whichever is less. For paracetamol ingestions ⩾ 30 g activated charcoal should be offered until 4 hours post-ingestion.
† If paracetamol concentration will not be available until > 8 hours post-ingestion, commence acetylcysteine while awaiting paracetamol concentration.
‡ Those patients with initial paracetamol concentrations more than double the nomogram line may benefit from an increase in acetylcysteine dose (see text) and a serum paracetamol and ALT concentrations should be checked at the end of the acetylcysteine infusion.
§ Patients should be advised that if they develop abdominal pain, nausea or vomiting further assessment is required.

ALT = serum alanine aminotransferase. ◆

Ufone 8:32 AM 76%
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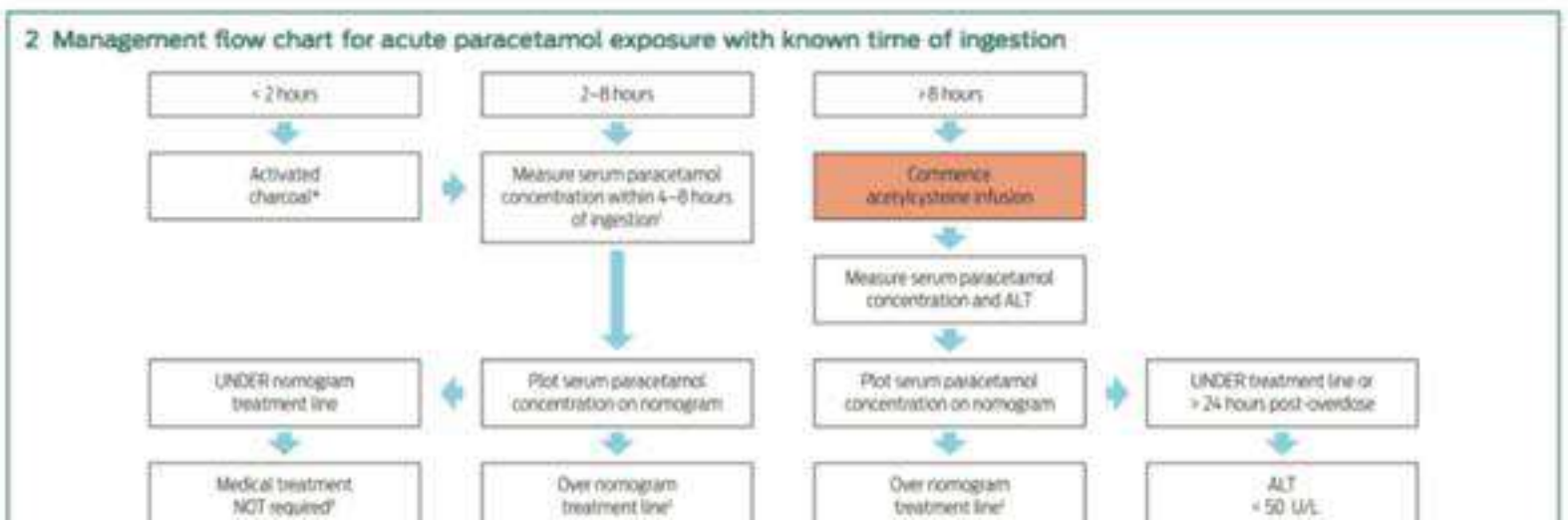
▶ When to refer to a liver unit

▼ Single ingestion < 8 hours

1. The patient is at **risk of hepatic injury if >10g or 200mg/kg of paracetamol** has been ingested.
2. Give **activated charcoal if they present within 2 hours**
3. If paracetamol concentration result can be determined **before 8 hours**, wait, plot against the nomogram and treat as appropriate.
4. If a paracetamol concentration cannot be determined within 8 hours, start NAC until the results are available.
5. **If NAC is given within 8 hours in non-massive exposures and a 20 hour infusion is completed no other blood tests are required.**


2 Management flow chart for acute paracetamol exposure with known time of ingestion
< 2 hours
2–8 hours
> 8 hours
Activated charcoal*
Measure serum paracetamol concentration within 4–8 hours of ingestion†
Commence acetylcysteine infusion
Measure serum paracetamol concentration and ALT
UNDER nomogram treatment line
Plot serum paracetamol concentration on nomogram
Plot serum paracetamol concentration on nomogram
UNDER treatment line or > 24 hours post-overdose
Medical treatment NOT required‡
Over nomogram treatment line†
Over nomogram treatment line†
ALT < 50 U/L

▼ Single ingestion 8 – 24 hours

1. The patient is at **risk of hepatic injury if >10g or 200mg/kg of paracetamol** has been ingested.
2. **Commence NAC infusion**
3. Measure paracetamol concentration and ALT/AST levels
4. If under the paracetamol treatment line and ALT/AST is <50 IU/L stop NAC. If results are abnormal continue 20 hour NAC infusion.
5. NAC is continued until the ALT/AST is stable or declining, the patient is asymptomatic and the paracetamol concentration is <10 mg/L (<66 micro mol/L).

A 64 year old female patient has a history of osteoarthritis and hypercholesterolaemia for which she takes co-codamol and simvastatin. She was recently prescribed Lisinopril as she had a third successive hypertensive reading at her GP surgery. Additionally she has been prescribed cinnarizine for motion sickness.

A week later she presents in the pharmacy asking for something to treat a raised, red rash on her legs, arms, and trunk.

What medication is most likely to be responsible for these symptoms?

- Cinnarizine
- Codeine
- Lisinopril
- Paracetamol
- Simvastatin

▼ Single ingestion > 24 hours

1. The patient is at **risk of hepatic injury if >10g or 200mg/kg of paracetamol** has been ingested.
2. **Beyond 24 hours the patient should be symptomatic** therefore, start NAC if the patient has nausea, vomiting, abdominal pain or encephalopathy.
3. A **biochemical risk assessment** can then be performed, if there is a detectable paracetamol concentration or the ALT/AST is >50 IU/L start a course of NAC
4. NAC is continued until the ALT/AST is stable or declining, the patient is asymptomatic and the paracetamol concentration is <10 mg/L (<66 micro mol/L)

A 58 year old woman presented to her GP with tremor and agitation. She has a past history of depression for which she has been on long term lithium therapy which has provided effective control. More recently, her GP noted that she was hypertensive and commenced new therapies. Initiation of which of the following is most likely to have precipitated her lithium toxicity?

- Amlodipine
- Atenolol
- Bendrofluazide
- Doxazosin
- Simvastatin

Peer responses

| | |
|---|---|
| Cinnarizine | 19% |
| Codeine | 3% |
| Lisinopril ✔ Correct answer selected | 70% |
| Paracetamol | 0% |
| Simvastatin | 7% |

ACE inhibitors are known to cause urticarial rash, especially lisinopril. The lisinopril should be stopped since there is some risk of anaphylaxis and alternative antihypertensive medication should be considered. A suitable antihistamine should be prescribed, but in this case the patient should be warned not to take it with cinnarizine, which is also an antihistamine.

| | |
|---|---|
| Atenolol | 3% |
| Bendrofluazide ✔ Correct answer selected | 81% |
| Doxazosin | 8% |
| Simvastatin | 3% |

Lithium is a drug used for bipolar affective disorder. It is a drug that needs to be kept within a narrow therapeutic range. If the drug level goes above this range, lithium toxicity occurs. Lithium toxicity ranges in severity from mild tremors, agitation, and confusion to ataxia, convulsions and arrhythmias. Interactions can occur between lithium and other agents that precipitate toxicity; in particular, diuretics both loop and thiazides through sodium depletion and reduction of excretion can increase the potential for lithium toxicity. ACE inhibitors may also cause lithium toxicity as can NSAIDs.

**#Serum_to_ascites_albumin_gradient_SAAG** 💥 identifies the presence of

**#portal_hypertension** and is more useful 💥

Calculating the SAAG:

➡️measuring serum albumin

➡️measuring albumin concentration of ascitic fluid.

🚩on the same day🚩

➡️subtracting the ascitic fluid value from the serum value.

**#If_SAAG**

➡️ >1.1 g/dl

➡️the patient has portal hypertension or high albumin gradient ascites

**#If_total_protein**

➡️ <2.5: **#Cirrhotic_ascites**

➡️ >2.5: **#Cardiac_ascites**

A 25 year old male heroin addict is arrested after he had shoplifted and, upon detention by the police, had taken his entire supply of heroin, had some heroin toxicity but had recovered. The following morning he was able to be discharged from MAU into police custody. However, he was concerned about the likelihood of withdrawal and wanted to know if there was any treatment he could have.

On assessment, the patient is felt to be at high risk of withdrawal from opiates.

Which of the following is the approach to managing this patient who will now be transferred to custody?

- Buprenorphine
- Diazepam
- Dihydrocodeine
- Give no medication
- Methadone

Fluoxetine ✔ Correct answer selected 89%

Metformin 0%

Losartan 9%

Simvastatin 0%

Selective serotonin reuptake inhibitors (SSRIs) are known to cause hyponatraemia. While it is more common in older patients, this effect is not exclusively seen in that age group. SSRIs are thought to cause hyponatraemia by inducing a syndrome of inappropriate antidiuretic hormone (SIADH). Antidiuretic hormone causes water to be absorbed from the collecting ducts of the kidneys, resulting in concentrated urine. Therefore, urine sodium concentration should be measured. A concentration of >20 mmol/L and a urine osmolality of >500 mOsmol/kg, in the presence of hyponatraemia, is diagnostic. Treat by stopping fluoxetine and consider alternative antidepressant therapy for this patient.

Diazepam

Dihydrocodeine 3%

Give no medication 6%

Methadone ✔ Correct answer selected 78%

In this patient, assessment has indicated a high risk of withdrawal. Withdrawal is itself associated with significant physical and psychological morbidity, with some reports of suicide in custody. Therefore, the approach to managing this patient would be one of prescribing opiate substitutes such as methadone or buprenorphine. NICE guidance suggests methadone is the drug of choice.

Following discharge from hospital, a 77 year old woman was reviewed by her GP and found to have the following urea and electrolytes:

| | |
|---|---|
| **Sodium** | 137 mmol/L (135-145) |
| **Potassium** | 5.3 mmol/L (35.-5.0) |
| **Urea** | 5.2 mmol/L (2.5-6.7) |
| **Creatinine** | 86 µmol/L (70-150) |

She has a history of osteoarthritis, ischaemic heart disease, hypertension, and atrial fibrillation, does not smoke and drinks a glass of wine daily. She takes warfarin, bumetanide, isosorbide mononitrate, bisprolol, co-codamol, spironolactone, simvastatin and ramipril. On examination, she had a BMI of 31, a heart rate of 72 bpm irregular and a blood pressure of 130/84mmHg. Her pulse was irregularly irregular.

The GP is concerned about the results and which are confirmed on repeat and asks you about them. Interaction between which of the following drugs is most likely to be the cause of her presentation?

- ○ Co-codamol - Bumetanide
- ○ Bumetanide - ramipril
- ○ Bumetanide- spironolactone
- ○ Ramipril - spironolactone
- ○ Ramipril- Bisoprolol

A 68 year old man presents to his GP with a two week history of profound tiredness and falls. He has a history of hypertension and type 2 diabetes for which he attended a review two weeks ago, where changes to his medication were made. He is a non smoker and drinks occasionally. On examination, he is apyrexial, has a regular heart rate of 42 bpm, a blood pressure of 112/72 mmHg and a respiratory rate of 14 breaths per minute.

His ECG reveals a rate of 42 bpm with no P waves preceding the QRS complexes

What drug interaction may have caused this problem?

- Atenolol - verapamil
- Co-codamol - atorvastatin
- Gliclazide - amlodipine
- Ramipril - gliclazide
- Simvastatin - amlodipine

| | | |
|---|---|---|
| ○ | Bumetanide - ramipril | 2% |
| | Bumetanide- spironolactone | 12% |
| ✔ | Ramipril - spironolactone<br>Correct answer selected | 83% |
| ○ | Ramipril- Bisoprolol | 2% |

This patient has hyperkalaemia with a potassium of 5.3 mmol/l. This is likely to be a consequence of the co-prescription of an ACE inhibitor together with spironolactone. Spironalactone is a potassium sparing diuretic. It acts on the late distal tubule in the nephron, by blocking the action of aldosterone - an aldosterone antagonist. It binds to the aldosterone dependent receptors at the sodium-potassium exchange site and causes increased amounts of sodium and water to be excreted while potassium excretion is inhibited. Consequently, the reabsorption of sodium (in exchange for potassium) is inhibited. ACE inhibitors such as lisinopril enhance this effect because of reduced levels of angiotensin II results in reduced aldosterone secretion.

Atenolol - verapamil ✔ Correct 96%

answer selected

Co-codamol - atorvastatin 1%

Gliclazide - amlodipine 2%

Ramipril - gliclazide 0%

Simvastatin - amlodipine 1%

Verapamil should not be prescribed together with a β-blocker, because it can cause produce problematic hypotension, heart failure as well as precipitate bradycardia and complete heart block. The more profound reactions tend to happen with IV verapamil, but it is relatively contraindicated for use together with a β-blocker even when given by mouth. It is thought that the negative inotropic and chronotropic effects of beta blockers and verapamil combine synergistically to cause the heart failure.

| | | |
|---|---|---|
| IV lorazepam ✔ Correct answer selected | | 39% |
| IV magnesium | | 1% |
| IV phenytoin | | 0% |
| IV saline drip | | 2% |
| IV sodium bicarbonate | | 58% |

**Explanation**

Serum alkalinization with intravenous sodium bicarbonate has been the mainstay of therapy in tricyclic antidepressant (TCA)-induced cardiovascular toxicity. QRS prolongation is most often the indication for serum alkalinization in TCA toxicity.

Seizures are usually self limiting but where treatment is necessary benzodiazepines are the treatment of choice. Although some recommend the use of phenytoin, its efficacy has never been proven. Patients with decreased conscious level and respiratory depression may require intubation.

A 52-year-old man is found collapsed at home with an empty box of amitriptyline tablets besides him. On arrival in hospital, the patient is agitated and has a generalised tonic-clonic convulsion. Which of the following is the most appropriate initial step in his management?

- IV lorazepam
- IV magnesium
- IV phenytoin
- IV saline drip
- IV sodium bicarbonate

A 68 year old man presents a prescription for co-amoxiclav and paracetamol after being bitten on the hand by his pet dog. He has a history of epilepsy for which he takes sodium valproate.

Six days later he returns feeling unwell and would like to know if his medication may be the cause.

He says he has been passing very pale stools but dark urine, has abdominal pain, fever and an intense itch.

Which drug is most likely to be the cause of this man's symptoms?

- ○ Amoxicillin
- ○ Sodium Valproate
- ○ Co-amoxiclav
- ○ Paracetamol
- ○ None of the above

| | |
|---|---|
| Sodium Valproate | 10% |
| Co-amoxiclav ✔ Correct answer selected | 81% |
| Paracetamol | 1% |
| None of the above | 4% |

Cholestatic jaundice can occur either during or shortly after the use of co-amoxiclav. The risk of acute liver toxicity is about 6 times greater with co-amoxiclav than with amoxicillin. Cholestatic jaundice is more common in males and in patients over the age of 65 years. Jaundice is usually self-limiting and very rarely fatal. The duration of treatment should be appropriate to the indication and should not usually exceed 14 days.

Although paracetamol overdosage is associated with liver damage, there is nothing to indicate that this patient has received an overdose.

Liver dysfunction (including fatal hepatic failure) in association with valproate, usually occurs in the first 6 months of therapy. Valproate is unlikely to be responsible for cholestatic jaundice in this patient, as he has been taking it for the last 5 years.

However, valproate is contraindicated in patients with active liver disease and treatment should be reviewed if the patient's liver dysfunction continues to deteriorate after stopping co-amoxiclav.

A 60 year old man was diagnosed with herpes zoster (shingles) and treated with aciclovir. The rash subsided but significant pain remained which was managed with co-codamol 30/500 and amitriptyline.

His regular medication consists of metformin, gliclazide, lisinopril and simvastatin. He is admitted with acute lower abdominal pain and an inability to pass urine.

Which drug has caused this man's problems?

- Acyclovir
- Amitriptyline
- Gliclazide
- Lisinopril
- Simvastatin

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| | | |
|---|---|---|
| ✔ Correct answer selected | Amitriptyline | 91% |
| | Gliclazide | 0% |
| | Lisinopril | 4% |
| | Simvastatin | 1% |

This man has acute urinary retention. Tricyclic antidepressants, including amitriptyline, have anticholinergic adverse effects including dry mouth, blurred vision, constipation, urinary retention, and drowsiness. Some tolerance develops to these effects and patients should be encouraged to persevere as long as these effects are mild. Severe adverse effects, such as acute urinary retention require prompt treatment. It can be difficult and demoralising when the adverse effects of a drug manifest themselves before the beneficial ones, so it is important to know when this will happen.

It is not recommended that patients with depression take amitriptyline, since it is particularly dangerous in overdose.

A 72 year old man presented to his GP with polydipsia, sight problems and general fatigue. He had a confirmed diagnosis of type 2 diabetes mellitus. He was prescribed metformin, simvastatin and aspirin and Lisinopril.

A few months later he is noted to have a macrocytic anaemia and the GP requests a further opinion.

Which of his medications is the most likely to be the cause of this?

- Simvastatin
- Lisinopril
- Aspirin
- Metformin
- None of the above

However, long term **metformin** is a known pharmacological cause of vitamin B12 deficiency leading to neurological symptoms, **megaloblastic anemia** and increased levels of serum homocysteine. Moreover, it is well known that vitamin B12 deficiency-induced neurologic symptoms precede the appearance of **megaloblastic anemia**.

At a routine GP consultation a 58 year old man had a blood pressure 158/116 mmHg.

He was advised on lifestyle modification in order to help lower his blood pressure.

On review a couple of months later, he was still hypertensive with a reading 156/112 mmHg.

The GP initiated antihypertensive medication.

Four weeks later while collecting he is admitted with abdominal pains and is noted to have marked constipation. He described the stools as hard, but normal in colour and odour. He had always taken care to eat a high fibre diet and drink plenty of fluid.

Which antihypertensive drug would be most likely to cause this man's problems?

- ○ Bisoprolol
- ○ Bendroflumethiazide
- ○ Losartan
- ○ Nifedipine
- ○ Ramipril

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| | |
|---|---|
| Simvastatin | 6% |
| Lisinopril | 1% |
| Aspirin | 8% |
| Metformin ✔ Correct answer selected | 33% |
| None of the above | 52% |

Metformin is known to cause vitamin B12 deficiency, so should always be suspected as a cause of raised MCV or megaloblastic anaemia. It is thought to inhibit vitamin B12 absorption from the ileum by affecting the calcium-dependent membrane action. When metformin is stopped, the vitamin B12 deficiency resolves; if it does not, an alternative cause must be sought. Long term metformin therapy has been known to cause a much more severe condition, with deterioration in mental state and peripheral neuropathy.

to cause this man's problems?

Peer responses

| | |
|---|---|
| Bisoprolol | 11% |
| Bendroflumethiazide | 30% |
| Losartan | 1% |
| Nifedipine ✔ Correct answer selected | 57% |
| Ramipril | 1% |

Nifedipine, along with other calcium channel blockers, is known to cause constipation. There is evidence to suggest that this is because it reduces the myoelectric response to eating. If the constipation does not resolve once it has been stopped, another cause should be sought. It is notable that this man has constipation despite a high fibre diet. Other antihypertensive medication are unlikely to cause constipation.

Further reading

You are the medical registrar and are asked by your surgical colleagues about a patient who requires an emergency laparotomy for an acute abdomen. The 70 year old male is treated with warfarin for atrial fibrillation and his INR is 3.5.

Which of the following do you advise?

- ○ Give IV fresh frozen plasma and vitamin k
- ○ Give IV fresh frozen plasma only
- ○ Give IV prothrombin complex concentrate and vitamin K
- ○ Give IV prothrombin complex concentrate only
- ○ Give IV vitamin K only

A. Give IV fresh frozen plasma and vitamin k — 16%

B. Give IV fresh frozen plasma only — 3%

C. Give IV prothrombin complex concentrate and vitamin K ← Correct answer — 53%

D. Give IV prothrombin complex concentrate only ✖ Incorrect answer selected — 19%

E. Give IV vitamin K only — 10%

In this emergency situation requiring urgent correction of the anticoagulation to permit surgery, the patient requires an infusion of IV vitamin K (takes about 4 hrs to work) and PCC (takes about 15 mins). These newer agents provide a far better reversal of coagulation than FFP.

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Two weeks later, the patient calls in to the pharmacy to ask your advice as he feels unwell. He has passed very little urine in the past 18 hours and is feeling nauseous.

You signpost him urgently to the local hospital where he is diagnosed with Acute kidney injury (AKI).

What is the most likely underlying condition which was exacerbated by his new medication?

- ○ Diabetes
- ○ Lisinopril hypersensitivity.
- ○ Glomerulonephritis.
- ○ Polycystic kidney disease.
- ○ Renal artery stenosis

A 59 year old man attended his GP surgery to review his blood pressure. As this was the third hypertensive reading the GP prescribed lisinopril.

Two weeks later, the patient calls in to the pharmacy to ask your advice as he feels unwell. He has passed very little urine in the past 18 hours and is feeling nauseous.

You signpost him urgently to the local hospital where he is diagnosed with Acute kidney injury (AKI).

What is the most likely underlying condition which was exacerbated by his new medication?

- ○ Diabetes
- ○ Lisinopril hypersensitivity.
- ○ Glomerulonephritis.
- ○ Polycystic kidney disease.
- ○ Renal artery stenosis

A 20 year old woman attends the admissions unit as she is concerned about some hard, painful lumps that have developed on her shins over the last two months. She reports no other symptoms and she has a background history of asthma. She is taking salbutamol and beclomethasone inhalers, montelukast, microgynon, and minocycline.

You look at her shins and there are multiple raised erythematous macules that have the appearance of bruises which are slightly tender and of about 5-10cm in diameter.

What is the rash the likely cause of these lesions?

- Minocycline
- Microgynon
- Montelukast
- Inhaled beclomethasone
- Sarcoidosis

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Glomerulonephritis. 0%

Polycystic kidney disease. 0%

Renal artery stenosis ✔ Correct answer selected 95%

This man has acute kidney injury (AKI) because he suffers from bilateral renal artery stenosis and took ACE inhibitors. Glomerular filtration rate (GFR) is usually dependent on rate of blood flow, an increase in flow results in an increased GFR. In patients with renal artery stenosis this flow is restricted. This activates the renin-angiotensin system, resulting in hypertension. It also means that GFR is dependent on angiotensin II mediated efferent arteriolar vasoconstriction. Consequently, preventing angiotensin II production with an ACE inhibitor will cause a fall in GFR and renal failure. This effect will only occur in patients with bilateral renal artery stenosis. It is important to be vigilant in prescribing ACE inhibitors to patients with any known arterial disease.

Further reading:

Merck Manuals: Lisinopril

A 26-year-old man is admitted after taking 15 g paracetamol about 6-8 hrs previously together with alcohol. He has a history of depression and left a note stating that he wanted to kill himself. He was commenced on IV N-acetylcysteine (NAC).

Plasma paracetamol concentration 90 mg/l (nomogram >70 to merit treatment at 6 hrs)

About 30 minutes into the NAC infusion, the patient becomes rather red and is aware of pruritus. What should be done?

- ○ Continue the NAC infusion at a slower rate
- ○ Stop the NAC infusion and switch to oral methionine
- ○ Stop the NAC infusion briefly and re-start at a slower rate
- ○ Stop the NAC infusion, do not restart due to risk of anaphylaxis and request dialysis
- ○ Stop the NAC infusion, give antihistamines and recommence infusion at slower rate

Peer responses

| | |
|---|---|
| Minocycline | 38% |
| Microgynon ← Correct answer | 23% |
| Montelukast | 2% |
| Inhaled beclomethasone | 0% |
| Sarcoidosis ✖ Incorrect answer selected | 37% |

This is a description of erythema nodosum, which is a symptom of several diseases, and an adverse reaction to various drugs, including the oral contraceptive pill. The patient may prefer to rely on barrier contraception, though in this case it is important that she does not become pregnant whilst taking a retinoid (isotretinoin). It may therefore be worth experimenting with other oral contraception or a long-acting reversible contraceptive (LARC) method. Erythema nodosum will take weeks to disappear even after the cause is removed, so patients may require symptomatic relief in the form of non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen or diclofenac.

Further reading:

Ufone 4:50 PM 59%
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Stop the NAC infusion and switch to oral methionine 8%

Stop the NAC infusion briefly and re-start at a slower rate 10%

Stop the NAC infusion, do not restart due to risk of anaphylaxis and request dialysis 9%

Stop the NAC infusion, give antihistamines and recommence infusion at slower rate ✔ Correct answer selected 58%

Adverse effects with flushing, redness and itch are common side effects associated with NAC occurring in roughly 15% of patients. However, the risk of hepatotoxicity is high in this person's case and the small risk of anaphylaxis is outweighed by the risk of hepatotoxicity if one does not give the treatment. The recommended approach is to briefly stop the NAC, give antihistamines and restart the infusion at a slower rate.

Reference:

A 36 year old woman was admitted to hospital with marked agitation. She had taken an overdose of Citalopram, at least 20 tablets of 20mg per tablet about 6 hours prior to admission.

On examination, she was confused and agitated. Her pulse was 110 bpm regular, blood pressure 130/80 mmHg and her temperature was 38.5C. She was noted to have hyperreflexia.

The patient was treated with IV fluids. Which of the following would be the approach to managing this patient?

- IV Diazepam
- IV Propranolol
- IV/IM Chlorpromazine
- IV/IM Haloperidol
- Sedation and intubation

- IV Diazepam ✔ Correct answer selected — 77%
- IV Propranolol — 1%
- IV/IM Chlorpromazine — 12%
- IV/IM Haloperidol — 4%
- Sedation and intubation — 6%

This patient has serotonin syndrome associated with a SSRI overdose. The condition is life threatening and this patient requires specific treatment which is supportive with IV fluids as well as moderate sedation with benzodiazepines in this case. It is suggested that drugs with anticholinergic side effects such as haloperidol and chlorpromazine should be avoided due to the effect of reducing sweating. Similarly beta blockers are contra-indicated.

A 36 year old woman was admitted to hospital with marked agitation. She had taken an overdose of Citalopram, at least 20 tablets of 20mg per tablet about 6 hours prior to admission.

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- IV/IM Chlorpromazine
- IV/IM Haloperidol
- Sedation and intubation

An 18 year old woman is admitted as an emergency after having a row with her parents and then taking her father's tablets. She had taken a pack of 30x120mg verapamil SR, 2 hours earlier. On admission, she seemed fine and regretted taking the tablets. Her blood pressure was 110/80 mmHg and pulse was 65 bpm reg.

Which of the following is the most appropriate approach to the management of this patient?

- ○ Admit and monitor only
- ○ Admit, monitor and give activated charcoal
- ○ Admit, treat with ipecac
- ○ Discharge after giving activated charcoal
- ○ Discharge as unlikely to have any further problems

Admit and monitor only 26%

Admit, monitor and give activated charcoal ✔ Correct answer selected 72%

Admit, treat with ipecac 2%

Discharge after giving activated charcoal 0%

Discharge as unlikely to have any further problems 0%

This patient has taken a potentially life threatening dose of verapamil and requires admission and monitoring. Calcium channel blocker overdose is treated very much like beta blocker overdose and, in this case, activated charcoal should be given immediately and the patient given IV fluids and monitored. If bradycardia and hypotension should develop, glucagon can be given.

A 66 year old female presents as her GP is concerned about her INR which is now 6. She has taken warfarin for approximately 2 years as anticoagulation for atrial fibrillation with the INR kept around 2.5 on a dose of 3-4 mg of warfarin daily. Her only other treatment includes losartan and amlodipine for hypertension.

On this occasion, her INR is 6.2. On further discussion, she informs you that she has most recently embarked on lifestyle and dietary changes. Which of the following products is likely to be responsible for this change in INR?

- Cranberry juice
- Fish oil tablets
- Garlic tablets
- Grapefruit juice
- Vitamin C tablets

Cranberry juice ✔ Correct answer selected — 32%

Fish oil tablets — 2%

Garlic tablets — 1%

Grapefruit juice — 64%

Vitamin C tablets — 0%

There is some evidence to suggest that cranberry juice enhances the anticoagulant effect of warfarin. It is important to recall that many patients take cranberry juice as prophylaxis against urinary tract infection. It is also taken by some for the flavinoids ('antioxidants') that it contains, which are thought to reduce the risk of developing various malignancies. Unfortunately, they are also known to inhibit cytochrome P450 enzymes. Warfarin is predominantly metabolised by P450 CYP2C9 and if this is inhibited, the INR will obviously rise.

Patients taking warfarin should avoid cranberry juice, at least until more is known about this potential interaction. It should be noted, however, that the potential interaction was observed in a patient who had consumed extremely large quantities of cranberry juice and very little else for several days. Consumed in moderation, the juice is probably unlikely to interfere with warfarin.

A 56 year old woman developed a subdural haematoma following a road traffic accident. It was surgically repaired and she made a good recovery. Her medication at discharge consisted of lisinopril, bendroflumethiazide, simvastatin and phenytoin.

Three months later she re-attends the acute clinic and informs you that her dentist said that she had something called 'gingival hyperplasia'.

Which drug is likely to have caused this?

- ○ Bendroflumethiazide
- ○ Lisinopril
- ○ Phenytoin
- ○ Simvastatin
- ○ None of the above

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| | | |
|---|---|---|
| ○ | Lisinopril | 0% |
| ○ | Phenytoin ✔ Correct answer selected | 99% |
| ○ | Simvastatin | 0% |
| ○ | None of the above | 0% |

Phenytoin, along with calcium channel blockers and cyclosporine, causes gingival hyperplasia. It is often asymptomatic, though patients with poor dental hygiene may report pain and bleeding on tooth brushing and in extreme cases displacement of the teeth and periodontal disease has been reported. It is obviously the role of the dentist to educate on the matter of dental hygiene, though it does not hurt to make sure that this occurs. The patient will need to have her medication changed at the neurology clinic.

Further Reading:

A 45 year old man was admitted feeling acutely unwell, breathless and ashen in appearance. He had gone out with friends the night before, drank alcohol and taken some 'pills' about 8 hours before his admission. He was otherwise well with no other history of note.

On examination, he was blue-grey in appearance, had a pulse of 110 bpm reg, a blood pressure of 120/80 mmHg, a temperature of 37C and oxygen saturations of 69%. Investigations revealed normal FBC, U+Es and a CRP of 12 mg/dl (<5). Arterial gases reveal:

| | |
|---|---|
| Ph | 7.32 (7.34-7.44) |
| pO2 | 29 kPa (11-13) |
| pCO2 | 3.3 kPa (4.5-6) |
| Bicarbonate | 13 mmol/l (22-26) |
| Methaemoglobin | 50% (1-2%) |

Which of the following is the most appropriate treatment for this patient?

- ○ Hyperbaric oxygen
- ○ IV Ascorbate
- ○ IV Methylene blue
- ○ IV Nitroprusside

An 80 year-old man presents with a three day history of shortness of breath and ankle swelling. He has a past history of hypertension and diabetes for which he takes rosuvastatin, losartan, aspirin, amlodipine and metformin. Recently his HbA1c has deteriorated to 57 mmol/mol (it was previously less than 53 mmol/mol) and he was commenced on pioglitazone.

On examination, he has bilateral ankle oedema with a blood pressure of 134/86 mmHg and pulse of 80 bpm.

Interaction between pioglitazone and which of the following is likely to be responsible for this patient's presentation?.

- ○ Amlodipine
- ○ Aspirin
- ○ Lisinopril
- ○ Metformin
- ○ Rosuvastatin

Interaction between pioglitazone and which of the following is likely to be responsible for this patient's presentation?.

Peer responses

| | |
|---|---|
| Amlodipine ✔ Correct answer selected | 85% |
| Aspirin | 1% |
| Lisinopril | 3% |
| Metformin | 2% |
| Rosuvastatin | 9% |

Explanation: Thiazoldinediones such as pioglitazone may have an antagonistic effect on myocardial calcium channels, thereby enhancing the effect of calcium channel blockers and may exacerbate oedema associated with either agent or may indeed precipitate heart failure.

A 58 year old man attends clinic complaining of muscle aches and pains. He does not smoke and drinks only occasionally. On examination, he is obese, has some muscle tenderness, heart rate 62 bpm and blood pressure is 142/88 mmHg

His medical history includes hypertension and type 2 diabetes for which he has taken stable medication for the last six months including amlodipine 10 mg daily, metformin 500mg tds, ramipril 5mg daily, aspirin 75 mg daily and atorvastatin 40 mg daily.

On further discussion, the only other piece of information that is relevant is that over the last month or so, he has begun to take his diet more seriously and has substituted fruit juices for some of his usual tea and coffee beverages.

Which of the following foodstuffs is likely to be responsible for his presentation?

- Fish oils
- Garlic tablets
- Kumquat peel
- Grapefruit juice
- Vitamin B supplements

| | | |
|---|---|---|
| | Kumquat peel | 13% |
| | Grapefruit juice ✔ Correct answer selected | 79% |
| | Vitamin B supplements | 1% |

Statins can cause mylagia/myositis and in its most severe form, rhabdomyolysis. The most likely cause of this patient's presentation is mylagia related to statins. Many patients experience these symptoms without any drug interaction taking place.

Statins are metabolised by cytochrome P450. Grapefruit juice is known to inhibit this, resulting in increased concentrations of atorvastatin if taken concurrently. Consequently, there is a greater risk of adverse reactions such as myositis.

The patient should be advised to stop drinking grapefruit juice immediately, and temporarily, to stop the atorvastatin. He or she can be reassured that the benefit conferred by statins is greater than that of taking grapefruit juice, assuming that the patient has some other source of vitamin C. Other citrus juices are not reported to cause this effect and are safe to take. This illustrates the importance of understanding the pharmacological effects of common foods.

Further reading

A 55 year old female presents with nausea, vomiting, headache and sweating.

On examination, she is apyrexial, has a heart rate of 98bpm, a blood pressure of 138/90mmHg and a respiratory rate of 18.

Four months ago, she was found to have hypertension, and was prescribed ramipril and atenolol.

Three days ago, she was prescribed amoxicillin, metronidazole and omeprazole in response to a positive urea breath test.

What drug interaction may have occurred?

- ○ Alcohol - metronidazole
- ○ Amoxicillin - atenolol
- ○ Amoxicillin - ramipril
- ○ Metronidazole - omeprazole
- ○ Ramipril - omeprazole

| | |
|---|---|
| Alcohol - metronidazole ✔ Correct answer selected | 71% |
| Amoxicillin - atenolol | 3% |
| Amoxicillin - ramipril | 6% |
| Metronidazole - omeprazole | 15% |
| Ramipril - omeprazole | 5% |

Metronidazole can cause the disulfiram reaction when taken with alcohol.

Alcohol is metabolised by the enzyme alcohol dehydrogenase, to acetaldehyde. Acetaldehyde is further metabolised by acetaldehyde dehydrogenase; both metronidazole and disulfiram inhibit this enzyme therefore acetaldehyde accumulates. Unfortunately, acetaldehyde produces the rather unpleasant symptoms described above. For most, overindulging significantly is required before achieving a relatively mild hangover, but if alcohol is consumed even in small quantities while a patient is taking metronidazole, they will rapidly experience severe symptoms. Therefore, it is important to warn patients not to drink alcohol whilst taking it.

This effect is utilised deliberately in disulfiram therapy, which alcoholics take to overcome the temptation to drink.

A 62 year old woman is referred to the medical intake with tingling and paraesthesia. The patient has been aware of deteriorating symptoms for one week. The GP asks whether this is a stroke. She has a background history of type 2 diabetes, hypertension and GORD for which she takes omeprazole, metformin, sitagliptin, simvastatin, Ramipril and amlodipine. On examination there is little of note.

Investigations reveal:

| | |
|---|---|
| Calcium | 2.06 mmol/l (2.2-2.6) |
| Magnesium | 0.3 mmol/l (0.7-1) |
| LFTs | Normal |

You see on the computer that a 25OHD level checked 1 month before by the GP reveals a level of 18 nmol/l (>50)

Which of the following is the likely cause of this patient's presentation?

- ○ Diabetic autonomic neuropathy
- ○ Metformin
- ○ Omeprazole
- ○ Sitagliptin
- ○ Vitamin D deficiency

Diabetic autonomic neuropathy 4%

Metformin ✖ Incorrect answer selected 6%

Omeprazole ← Correct answer 25%

Sitagliptin 7%

Vitamin D deficiency 58%

This patient has a hypocalcaemia associated with a severe hypomagnesaemia. This is likely due to the omeprazole, which results in increased GI magnesium losses. The hypomagnesaemia impairs the calcium sensing on the parathyroid cells; hence, this results in an induced hypoparathyroidism with hypocalcaemia. It is a good diagnosis to make but is often not appreciated.

This is not due to vitamin D deficiency as with osteomalacia the 25OHD would be lower, ALP raised and the patient would likely have a proximal myopathy.

A 45 year old woman with a history of depression is admitted after taking an overdose of citalopram together with consuming alcohol in a suicide attempt. Her relatives state that following an argument she went off and was found in the local park some 4 hours later, inebriated, having taken about 30x40mg citalopram tablets. On examination, she had a temperature of 39.5C, a pulse of 110 bpm reg and a blood pressure of 100/60 mmHg. She is agitated with a GCS of 15. ECG reveals a sinus tachycardia. The patient is treated with activated charcoal and IV fluids.

Which of the following is the most appropriate approach to the management of this patient?

- IV diazepam
- IV glucagon
- IV insulin/glucose
- IV metoprolol
- Supportive therapy only required

IV insulin/glucose 2%

IV metoprolol 4%

Supportive therapy only required 49%

SSRI overdose is quite common and usually safe, though citalopram is an exception as it may prolong the QT interval. Serotonin syndrome may develop and is associated with symptoms of anxiety, agitation, tachycardia, seizures and hyperthermia. In this case, the patient has taken a high dose of citalopram and is agitated. She has been given activated charcoal and the appropriate treatment for the agitation, which may prevent the development of seizures, is IV diazepam. Oral cyproheptadine is also an agent that has been used with some success in the treatment of SSRI overdose.

A 76 year old man has a history of mild exercise induced angina, atrial fibrillation, hypertension and type II diabetes mellitus.

He is taking pioglitazone, metformin, isosorbide mononitrate, digoxin, atorvastatin, bendroflumethiazide and warfarin.

He is admitted after presenting with increasing breathlessness, a blood pressure of 148/100 mmHg, an irregular pulse of 84 bpm and swollen ankles.

Which of the medications is most likely to have been responsible for his presentation?

- Atorvastatin
- Bendroflumethiazide
- Digoxin
- Metformin
- Pioglitazone

Bendroflumethiazide 0%

Digoxin 1%

Metformin 1%

Pioglitazone ✔ Correct answer 97%

selected

Studies suggest that approximately 5% of patients taking glitazones develop oedema which may precipitate heart failure. Oedema is often worsened with the addition of other therapies such as calcium antagonists. NICE recommends that pioglitazone should be avoided in people with heart failure, and those at risk of fracture. If used in patients taking insulin, the danger is further increased. Treatment is to stop pioglitazone and treat heart failure as usual.

A 19-year-old man attends the Emergency Department having allegedly taken 32 x 500 mg paracetamol tablets 8 hours ago. Examination is unremarkable. His blood work is sent off and he is commenced on an intravenous infusion of N-acetylcysteine.

What is the toxic metabolite in paracetamol?

- Mercapturic acid
- N-acetyl-p-aminophenol glucuronide
- N-acetyl-p-aminophenol sulphate
- N-acetyl-p-benzoquinone imine
- Salicyluric acid

Mercapturic acid 12%

N-acetyl-p-aminophenol glucuronide 46%

N-acetyl-p-aminophenol sulphate 4%

N-acetyl-p-benzoquinone imine 38%

✔ Correct answer selected

Salicyluric acid 0%

Explanation

Paracetamol is primarily metabolised in the liver to glucuronide and sulphate conjugates. A small proportion is oxidised by the enzyme CYP2E1 via CYP450-dependent pathways in the liver, leading to the formation of NAPQI, the toxic intermediate metabolite. NAPQI is detoxified by conjugation with glutathione and the bound NAPQI product is excreted in urine or bile. Hepatotoxicity can occur in overdose when the glutathione is 'used up' resulting in excess NAPQI.

Amphetamines 10%

Cocaine 1%

Ecstasy (MDMA) ✖ Incorrect answer selected 21%

Ketamine 12%

Psychedelic mushrooms ← 57%

Correct answer

This young man has developed acute liver failure as a likely consequence of the ingestion of a hepatotoxic drug. Such drugs include psychedelic mushrooms, anti-TB therapy, anticonvulsants and paracetamol. In this case the consumption of psychedelic mushrooms may well be the precipitant of acute liver failure with psilocybin mushrooms often being confused with amatoxin mushrooms, which can produce fatal hepatotoxicity.

Ufone 10:22 AM 53%
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A 72 year old man with a 12 year history of diabetes being treated with metformin attends as a GP admission, as he is lethargic and the GP is concerned about his persistent hyperkalaemia. His HbA1c 7.5% (<6). He also has a history of hypertension for which he takes bisoprolol 5 mg daily, amlodipine 10 mg/d, simvastatin 40mg/d and aspirin 75 mg/d.

He has been re-referred to clinic by his GP as he has been noted to have a persistent hyperkalaemia. Previously he was taking an ACE inhibitor but this was stopped one year ago.

| | |
|---|---|
| Sodium | 132 mmol/l (134-144) |
| Potassium | 5.8 mmol/l (3.5 – 5) |
| Urea | 8.8 mmol/l (3-8) |
| Creatinine | 100 micromol/l (50-100) |
| Glucose | 14.1 mmol/l (3.5-5.5) |

Which of the following is the likely cause of this man's hyperkalaemia?

- ○ Auto-immune hypoadrenalism
- ○ Bisoprolol
- ○ Chronic renal failure
- ○ Metformin
- ○ Renal artery stenosis

# Autoimmune Polyendocrine Syndromes

ASHISH SINGH
MEDICOWESOME

## Type 1

Autosomal recessive

AIRE gene mutation
[AutoImmuneREgulator]
on chromosome 21

## Type 2

Polygenic cause

HLA D3 and D4 linked

***Addison's disease***

Hypoparathyroidism

Chronic mucocutaneous candidiasis

Type 1 Diabetes Mellitus

Autoimmune thyroid problems:
Hashimoto's or Grave's disease

| | | |
|---|---|---|
| A | Auto-immune hypoadrenalism<br>✖ Incorrect answer selected | 50% |
| B | Bisoprolol ← Correct answer | 11% |
| C | Chronic renal failure | 14% |
| D | Metformin | 8% |
| E | Renal artery stenosis | 17% |

This patient has a long history of hypertension and hyperkalaemia. He has a mild hyponatraemia associated with the hyperkalaemia and the most likely diagnosis is type 4 renal tubular acidosis or hyporeninaemic hypoaldosteronism. The most likely drug to cause this is the beta blocker and this should be stopped. Other drugs implicated include ACE inhibitors and NSAIDs. At this age and in a patient that does not have other autoimmune disease (T2DM), this is unlikely to be hypoadrenalism

You are called to see a 42 year old male patient on the neurosurgical ward. He was admitted with a head injury 3 days ago which required only observation. However, he has become more confused in the last 12 hours and his most recent U+Es performed this morning reveal:

| | |
|---|---|
| Sodium | 125 mmol/l (134-144) |
| Potassium | 4.5 mmol/l (3.5-5.5) |
| Urea | 6.8 mmol/l (3-8) |
| Urine Osmolality | 620 mosmol/l |
| Urine Sodium | 125 mmol/l |

Checking through his records, the previous days his U+Es were normal. He had been allowed to eat and drink normally and had stopped IV fluids 2 days ago. He was on dexamethasone the dose of which had been reduced to 4mg daily from 8 mg daily over the last day but he was on no other treatment.

On examination, he had Glasgow Coma Scale of 15, though seemed confused with him being disorientated. Oxygen saturations were 97% on air and his blood pressure was 110/80 with a pulse of 88 bpm.

Which of the following is the most likely diagnosis?

- ○ Acute hypoadrenalism
- ○ Cerebral Salt Wasting
- ○ Pituitary apoplexy
- ○ Syndrome of inappropriate ADH secretion
- ○ Type IV renal Tubular acidosis

Acute hypoadrenalism 3%

Cerebral Salt Wasting ← 23%

Correct answer

Pituitary apoplexy 1%

Syndrome of inappropriate ADH secretion ✖ Incorrect answer selected 72%

Type IV renal Tubular acidosis 0%

The most likely diagnosis in this patient with head injury who then develops acute symptomatic hyponatraemia and grossly elevated urine sodium is cerebral salt wasting. The grossly elevated urine sodium (>100) is highly suggestive as the sodium is usually less with SIADH. Similarly with SIADH, there is a dilutional element so urea and potassium typically reflect this dilution being themselves low normal in contrast to CSW where there is hypovolaemia and hence higher concentrations. Hypoadrenalism is an incorrect answer as the patient is already on a high dose of steroids – dexamethasone 4mg/d.

A 50 year old man with type 2 diabetes treated with novomix-30 16 units BD, empagliflozin 10 mg OD and sitagliptin 100 mg OD is admitted with traumatic brain injury. He is managed in the ITU after neurosurgical intervention. He is being established on long term enteral feed through a PEG starting at 8 am in the morning and running for 16 hours. His HbA1C pre-admission was 65 mmols/mol (<60).

What advice should be given regarding his diabetes management?

- ○ Continue NovoMix 30 S.C. 16 units at 8am and 16 units at 6pm, with dose titration as needed
- ○ Increase empagliflozin to 25 mg od and use through PEG tube after crushing the tablets
- ○ Keep the patient on intravenous insulin infusions as much as possible
- ○ Start on basal insulin once a day at the end of feed
- ○ Use short acting insulin as bolus doses if blood glucose >12 mmol/l

units at 8am and 16 units at 6pm, with dose titration as needed ✔ Correct answer selected

Increase empagliflozin to 25 mg od and use through PEG tube after crushing the tablets 2%

Keep the patient on intravenous insulin infusions as much as possible 17%

Start on basal insulin once a day at the end of feed 30%

Use short acting insulin as bolus doses if blood glucose >12 mmol/l 4%

It is not advisable to crush tablets and use via NG tube as the efficacy may be lost. JBDS advises one of the three options 1. Pre-mixed (30/70) human insulin at start and midpoint of feed. 2. Isophane insulin at start and midpoint of feed. 3. Continuation of basal insulin if already prescribed with bolus doses soluble insulin at start, 6 and 12 hours into feed as required.

| | | |
|---|---|---|
| Lactate | 2.1 mmol/l | 0.5-1 |
| Ketones (on meter) | Hi | |

Which of the following is the likely cause of her presentation?

- ○ Diabetic ketoacidosis
- ○ Drug-induced ketoacidosis
- ○ Drug-induced lactic acidosis
- ○ Sepsis with fasting ketosis
- ○ Sepsis with mixed fasting ketosis/lactic acidosis

A 71-year-old woman was admitted with a two day history of increasing fatigue and decreasing level of consciousness. She had otherwise been well. She had type 2 diabetes for which she was being treated with metformin 500 mg bd, empagliflozin 10 mg daily, ramipril 10mg daily and atorvastatin 10 mg daily. On examination she had a temperature of 38C, a blood pressure of 100/70 mmHg and a pulse of 100 bpm with a respiratory rate of 28/min. Her Glasgow Coma Scale score was 12. There was nil of note on abdominal, respiratory, neurological or cardiovascular examination. Results revealed:

| Test | Result | Normal range |
|---|---|---|
| Haemoglobin | 12 g/dl | 12-16 |
| White cell count | 14.5x109/l | 3.5-10 |
| Platelet | 210x109/l | 150-400 |
| Sodium | 140 mmol/l | 134-144 |
| Potassium | 5 mmol/l | 3.5-5 |
| Creatinine | 210 micromol/l | 50-100 |
| Urea | 8.3 mmol/l | 3-8 |
| Glucose | 14.5 mmol/l | 3.5-5.5 |
| pH | 7 | 7.35-7.45 |
| Bicarbonate | 7 mmol/l | 22-28 |
| pCO2 | 1.9 kPa | 4.5-6 |
| pO2 | 14.8 kPa | 10.5-13 |
| Lactate | 2.1 mmol/l | 0.5-1 |
| Ketones (on meter) | Hi | |

Drug-induced ketoacidosis ✔ 24%

Correct answer selected

Drug-induced lactic acidosis 4%

Sepsis with fasting ketosis 5%

Sepsis with mixed fasting ketosis/lactic acidosis 28%

This patient has developed a severe metabolic acidosis as suggested by the low pH and low bicarbonate with some respiratory compensation. The ketones are high which is highly relevant here, particularly as the lactate is only modestly high and does not suggest lactic acidosis. A good going lactic acidosis would be above 5. Also, the glucose is only modestly elevated. This fits the picture of a drug-induced ketoacidosis due to the SGLT-2 inhibitor, empagliflozin. Whilst a very effective diabetic medication, all SGLT-2 inhibitors have been rarely implicated in euglycaemic or modestly hyperglycaemic ketoacidosis, an effect of their mechanism of action relaying on urinary glucose excretion. Often illness, fasting and vomiting exacerbate the ketosis.

A 62 year old woman attends A&E feeling unwell. She is lethargic, has had occasional episodes of abdominal pain and is clinically dehydrated. She has a recent history of metastatic breast cancer with bony involvement, for which she is receiving palliative treatment. Her results reveal:

| | |
|---|---|
| Sodium | 144 mmol/l (134-144) |
| Potassium | 3.3 mmol/l (3.5-5.5) |
| Urea | 10.8 mmol/l (3-8) |
| Creatinine | 255 micromol/l (50-100) |
| Calcium | 4.1 mmol/l (2.2-2.6) |

Which of the following is the most appropriate initial treatment for this patient?

- IM Calcitonin
- IM Denosumab
- IV Hydrocortisone
- IV N Saline – 1l over 2hrs initially
- IV Pamidronate

IV Hydrocortisone 0%

IV N Saline – 1l over 2hrs initially 97%

✔ Correct answer selected

IV Pamidronate 2%

The most appropriate initial treatment for this patient is IV rehydration with N Saline (4-6l over 24hrs). Once rehydration is considered adequate, the patient can then be treated with IV bisphosphonates such as pamidronate, but caution needs to be exercised with the acute kidney injury. In this case the likely cause is metastatic bone disease, so regular bisphosphonate infusions may be required.

A 28 year old female presents with a 3 week history of flu-like symptoms followed by severe pain in her neck. Examination reveals a mild tremor and pulse of 90 bpm reg and tenderness to palpation of a mild enlarged goiter.

Thyroid function tests reveal:

| | |
|---|---|
| Free T4 | 20.9 pmol/l (9-20) |
| Free T3 | 4.4 pmol/l (3.5-7) |
| TSH | 1.8 mu/l (0.5-4.5) |

The best treatment to control her symptoms is:

- ○ Anti-inflammatories
- ○ Bisoprolol
- ○ Carbimazole
- ○ Prednisolone
- ○ Thyroidectomy

The best treatment to control her symptoms is:

Peer responses

| | | |
|---|---|---|
| Anti-inflammatories<br>answer selected | ✔ Correct | 58% |
| Bisoprolol | | 5% |
| Carbimazole | | 3% |
| Prednisolone | | 34% |
| Thyroidectomy | | 0% |

This is a thyroiditis. Steroids and anti-thyroid drugs are not beneficial here. Her main symptoms are pain and tenderness which should improve rapidly with anti-inflammatories. There is no evidence of tachycardia or overt hyperthyroidism upon which a non cardioselective B-blocker such as propranolol would be preferred.

A 20-year-old lady is admitted to A&E with abdominal pain, nausea and vomiting. She has a 5 year history of type 1 diabetes with poor adherence to her therapy. Her current insulin regimen comprises insulin glargine and Novorapid via a basal bolus regimen. On examination she is dehydrated and breathing deeply, her blood pressure is 98/66 mm/hg and her pulse is 105 bpm.

Investigations-

| | Test Results | Normal Range Examples |
|---|---|---|
| **Plasma Glucose** | 21.2 mmol/l | <7.8 |
| **pH** | 6.9 | 7.35 - 7.45 |
| **pCO2** | 3.2 kPa | 4.7 - 6 |
| **pO2** | 12.1 kPa | 9.5 - 13 |
| **Serum bicarbonate** | 5.2 mmol/l | 22 - 27 |
| **Haemoglobin** | 15.9 g/dl | 12 - 16 |
| **wCC** | 21.1 X $10^9$/L | 4 - 11 |

Which of the following is a feature of the pathophysiology of diabetic ketoacidosis?

- ○ Acetoacetate is metabolized to beta hydroxybutyrate
- ○ Acidaemia is the primary cause of intracellular potassium loss
- ○ Hepatic glucose production reaches a plateau within 4 hours of insulin withdrawal
- ○ Hepatic glucose production rises gradually over the first 6 - 8 hours following insulin withdrawal
- ○ Insulin deficiency combined with cortisol and catecholamine excess is the main cause of ketone body formation

Ufone 12:17 PM 31%
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Insulin deficiency combined with 41% cortisol and catecholamine excess is the main cause of ketone body formation

correct C

Diabetic ketoacidosis (DKA) is an extension of the normal fasting state. Hepatic glucose production rises rapidly over the first 2 – 4 hours following insulin withdrawal reaching a plateau after around 4 hours. These changes correlate with the initial acute rise in glucagon concentrations, with other counter-regulatory hormones being little affected initially. Basal hepatic glucose production in DKA is approximately twice that in stable diabetic patients, with a much smaller decrease in peripheral glucose utilisation. Lack of insulin causes direct stimulation of carnitine acyl CoA transferase 1 and high glucagon levels inhibit the formation of malonyl CoA, further stimulating transferase activity. Consequently there is a switch NEFA resterification to oxidation. Beta-hydroxybutyrate is produced in excess and is subsequently metabolised to acetoacetate which is detected in urine ketone analysis by dipstick testing. Glucagon levels also increase levels of carnitine further enhancing fatty acid oxidation. Cortisol and catecholamines directly stimulate lipolysis. Glucagon is of particular importance as ketone body levels rise early, with a continuous increase over 10 – 12 hours. Acidaemia, combined with hyperglycaemia and hyperglucagonaemia, promote intracellular loss of potassium. The final serum potassium concentration largely depends on the rate of urinary potassium loss. Platelet secretory activity is often increased in DKA, but aggregation decreased. Neutrophil count is also commonly raised and correlates with ketone body levels, so does not necessarily imply underlying infection.

A 60 year old woman is admitted with a history of being acutely unwell, diarrhoea and more recent confusion. She gives no other history of note and is particularly agitated on admission. Her husband informs you that she has little of note in her history but has become increasingly agitated and has lost weight over the last one month.

Examination reveals that she is confused with a GCS of 15. She has a BMI of 18 kg/m2, a pulse of 120 bpm irregular, blood pressure of 110/65 mmHg and a temperature of 38.9C. She has an obvious goitre with an audible bruit.

Results reveal:

| | |
|---|---|
| FBC | Normal |
| U+Es | Normal |
| CRP | 15 (<5) |
| ECG | Atrial fibrillation |

Which of the following is the most appropriate initial treatment for this patient?

- IV amoxicillin and metronidazole
- IV potassium Iodide
- IV propranolol
- Oral carbimazole
- Oral propylthiouracil

Ufone 12:36 PM 27%
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A 21-year-old lady with a 10 year history of type 1 diabetes has a most recent Hba1c of 7.8% ( < 6) is admitted to A&E following an overdose of her basal insulin. On examination she is conscious but pale and sweaty, her blood pressure is 96/66 mmHg, her pulse is 135 beats per minute and her plasma glucose is 1.8 mmol/l.

At what plasma glucose level would you expect significant autonomic counter-regulatory responses to develop in patients with type 1 diabetes?

- ○ ≤1 mmol/l
- ○ ≤1.5 mmol/l
- ○ ≤2 mmol/l
- ○ ≤2.5 mmol/l
- ○ ≤3.5 mmol/l

Mark Skip Exit

IV propranolol ✔ Correct answer selected — 58%

Oral carbimazole — 15%

Oral propylthiouracil — 9%

This patient appears to be developing thyroid storm as revealed by a temperature, agitation, confusion, atrial fibrillation and goitre. We are not provided with the TFTs as these will often take some time to process even if asked for acutely. In this case the IV beta-blockers would be the most appropriate approach as treatment for the atrial fibrillation and these also prevent the peripheral conversion of T4 to T3. Either oral propylthiouracil or carbimazole should be given but both will take 2 hours to have an effect on the production of thyroid hormone and of course neither will prevent the release of stored hormone. Thioamides must be given at least one hour prior to the use of iodides which do block the release of stored hormone. Also, the patient should receive IV steroids.

≤2.5 mmol/l ✔ Correct answer 35%

selected

≤3.5 mmol/l 26%

Autonomic counter-regulatory responses, including beta adrenergic stimulation and catecholamine secretion, commence at a threshold plasma glucose level ≤ 3.9 mmol/l in non-diabetic individuals and often occur at a lower level in patients with diabetes (especially well controlled diabetics) which means that adrenergic symptoms of hypoglycemia do not appear until the blood glucose drops to the lowered threshold that elicits the epinephrine response. This change in epinephrine response does not appear to be related to a structural abnormality of the adrenal medullae since diabetic patients with defective epinephrine response to hypoglycaemia have normal epinephrine responses to other stimuli such as exercise, standing or a meal. All defences against hypoglycemia—namely, the reduction of insulin and increments in glucagon and epinephrine—are impaired in type 1 diabetes, causing the clinical syndrome of defective glucose

A 55 year old female attends A_E with a one week history of sickness, lethargy and fatigue. She has a two year history of metastatic breast carcinoma. On examination, she appears dehydrated and unwell.

Her investigations reveal:

| | |
|---|---|
| **Sodium** | 148 mmol/l (134-144) |
| **Potassium** | 4.8 mmol/l (3.5-5) |
| **Urea** | 12.8 mmol/l (3-8) |
| **Creatinine** | 180 micromol/l (50-100) |
| **Calcium** | 3.8 mmol/l (2.2 - 2.6) |

Which of the following is the most appropriate initial treatment for this patient?

- ○ IV Calcitonin
- ○ IV Dextrose
- ○ IV Normal saline
- ○ IV Pamidronate
- ○ IV Prednisolone

IV Dextrose 0%

IV Normal saline ✔ Correct 97%

answer selected

IV Pamidronate 2%

IV Prednisolone 0%

This patient has marked hypercalcaemia as reflected by the calcium above 3 mmol/l. The most appropriate initial management of this patient with dehydration and hypercalcaemia which is likely to be malignancy related is IV rehydration with normal saline. One would not contemplate IV bisphosphonate until rehydration is completed as this would compound the nephrotoxicity.

A 62 year old man is admitted acutely with a week history of feeling increasingly unwell and tired. He has a history of type 2 diabetes for which he takes metformin 1g bd and gliclazide 80mg bd. His last HbA1c was 10.5% (< />

On examination he appears dehydrated and unwell. His temperature is 37C , blood pressure 116/70 mmHg and a pulse of 102 bpm. Oxygen saturation is 98% on air and he has a respiratory rate of 22/min.

Blood results reveal:

| | |
|---|---|
| Sodium | 150 mmol/l (134-144) |
| Potassium | 5.5 mmol/l (3.5-5.5) |
| Urea | 15.5 mmol/l (3-8) |
| Glucose | 24.5 mmol/l (3.5-5.5) |
| pH | 7.28 (7.35-7.45) |
| Bicarbonate | 10 mmol/l (22-28) |

Which of the following is the likely diagnosis?

- ○ Acute kidney injury associated with ACE inhibitor
- ○ Diabetic Ketoacidosis
- ○ Hyperosmolar Hyperglycaemic state
- ○ Type A lactic acidosis
- ○ Type B lactic acidosis associated with metformin

Diabetic Ketoacidosis ← 28%

Correct answer

Hyperosmolar Hyperglycaemic state ✖ Incorrect answer selected 49%

Type A lactic acidosis 2%

Type B lactic acidosis associated with metformin 20%

The most likely diagnosis is diabetic ketoacidosis (patient is acidotic) in a poorly controlled type 2 patient that may well have Latent Autoimmune Diabetes of Adulthood (LADA). Lactic acidosis with metformin is very rare and the patient's usually have severe renal impairment and would not be expected at this patient's level of dehydration. There is likely to be ketones present on POCT testing. This is not HHS as plasma osmolality is usually above 320 and glucose above 33 with a pH >7.3.

A 21 year old male presents with a sudden onset weakness and is unable to move for approximately 1 hour. He gives little other history except for losing two to three pounds in weight over the last two months. On admission to hospital, he has a pulse of 100 bpm, a blood pressure of 105/80 mmHg but he has made a full recovery and muscle strength is normal with normal reflexes and flexor plantar responses. His investigations reveal:

| | |
|---|---|
| **FBC** | Normal |
| **U+Es** | Normal |
| **LFTs** | Normal |
| **Calcium** | 2.25 mmol/l (2.2 - 2.6) |
| **Glucose** | 5.5 mmol/l (3.5 - 5.5) |

Which of the following would be an appropriate investigation for this patient?

- ○ 24hr Urine free cortisol
- ○ EMG
- ○ Oral glucose tolerance test
- ○ Thyroid function tests
- ○ Vitamin D concentration

Peer responses

24hr Urine free cortisol ✖ 6%

Incorrect answer selected

EMG 20%

Oral glucose tolerance test 7%

Thyroid function tests ← 54%

Correct answer

Vitamin D concentration 13%

This young male presents with a sudden onset of complete weakness with speedy recovery. The diagnosis suggests hypokalaemic period paralysis and one finds that the potassium is low only during the episodes of weakness. However, a form fruste of this is thyrotoxic periodic paralysis and the patient should have TFTs assessed.

A 62 year old woman with acute symptomatic hyponatraemia likely due to SIADH and associated with drowsiness is considered to be appropriate for immediate treatment with hypertonic saline. Her serum sodium is 115 mmol/l. What is the target sodium to which you would treat this patient over the next 1hr?

- 116 mmol/l
- 120 mmol/l
- 125 mmol/l
- 130 mmol/l
- 135 mmol/l

(D) 116 mmol/l ✖ Incorrect answer 29%

selected

(C) 120 mmol/l ← Correct answer 66%

(B) 125 mmol/l 4%

(A) 130 mmol/l 0%

(E) 135 mmol/l 0%

A decision has been taken to treat this patient with hypertonic saline as she has acute symptomatic hyponatraemia which reflects underlying cerebral oedema. In this context, treatment with 150mls 3% hypertonic saline given over three hours can be lifesaving. The target sodium by which one should elevate the sodium is 5 mmol/l over the first hour. The increase in sodium should be then limited to 10mmol/l over the next 24hrs based on a clinical improvement.

A 52 year old female is admitted with an intracranial bleed. She undergoes clipping of an cerebral arterial aneurysm and was well the following morning. The following biochemistry are noted post-operatively: (Normal ranges Sodium 135-145, potassium 3.5 -5, Urea 3-8, Creatinine 50-100)

| | | | | |
|---|---|---|---|---|
| **Day 1** | Plasma Sodium 131 mmol/l | Potassium 3.6 mmol/l | Urea 4.5 mmol/l | Creatinine 95 µmol/L |
| **Day 2** | Plasma Sodium 126 mmol/L | Potassium 3.4 mmol/L | Urea 4.2 mmol/L | Creatinine 88 µmol/L |
| **Day 3** | Plasma Sodium 123 mmol/L | Potassium 3.5 mmol/L | Urea 5 mmol/L | Creatinine 88 µmol/L |
| **Day 4** | Plasma sodium 120 mmol/L | Potassium 3.5 mmol/L | Urea 5 mmol/L | Creatinine 88 µmol/L |

On day 4 she was commenced on a fluid restriction of 1 litre per day. The following were noted at that stage: Plasma osmollity 258 mosmol/l (275-305) urine osmolality 688 mosmol/l with urine sodium 84 mmol/l.

Which of the following is the most likely diagnosis to explain the hyponatraemia?

- ○ Cranial diabetes insipidus
- ○ Hypoadrenalism
- ○ Fluid overload
- ○ Syndrome of inappropriate ADH (SIADH)
- ○ Sick cell syndrome

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Osmotic demyelination A+ A-

Thus, because there is no proven advantage to correcting hyponatremia by more than 4 to 6 meq/L per day, we and other authors recommend that the rate of correction of hyponatremia should not exceed 6 to 8 meq/L in any 24-hour period [38]. This is not a goal of therapy, but rather a therapeutic limit that should not be exceeded. In the past, it was thought that the serum sodium concentration should be increased to a supposedly "safe" level of 120 to 128 meq/L. There is no evidence to support this practice, and doing so could result in marked overcorrection of hyponatremia in patients with very low serum sodium concentrations. We recommend a correction goal of 4 to 6 meq/L per day, no matter how low the initial serum sodium concentration is. (See "Overview of the treatment of hyponatremia in adults".)

**Causes of overly rapid correction** — Overly rapid correction of hyponatremia can result from two general mechanisms: following therapy that is specifically directed at raising the sodium concentration (such as hypertonic saline or initiation of a vasopressin antagonist); and following cessation of a reversible stimulus to antidiuretic hormone (ADH) release or cessation of exogenous dDAVP therapy. If renal function is normal, removal of a stimulus to ADH release results in a urine osmolality that is usually below 100 mosmol/kg, leading to rapid excretion of the excess water (called autocorrection).

Cranial diabetes insipidus 15%

Hypoadrenalism 0%

Fluid overload 5%

Syndrome of inappropriate ADH (SIADH) 80%

✔ Correct answer selected

Sick cell syndrome 0%

This patient has a deteriorating hyponatraemia with an inappropriately elevated urine osmolality and urine sodium excretion (should be less than 20 mmol/l). The most likely diagnosis is therefore SIADH. There is no evidence of hypoadrenalism. Diabetes insipidus would produce excessive fluid loss with hypernatraemia. Fluid overload is a potential diagnosis yet we are informed that the patient underwent fluid restriction.

You are called to see a 42 year old female who has become particularly confused. She was admitted three days prior following an accident on her bike and had sustained a cerebral contusion. This did not require any neurosurgical intervention. On examination, she was drowsy with a GCS of 13 and bilateral upgoing plantars but no focal neurology. Her pulse is 68 bpm with a blood pressure of 128/80 mmHg. Oxygen saturations are 99% on air.

Her blood results reveal the following:

| | |
|---|---|
| Sodium | 118 mmol/l (134-144) |
| Potassium | 3.8 mmol/l (3.5-5.5) |
| Urea | 4.5 mmol/l (3-8) |
| Creatinine | 80 micromol/l (50-100) |
| Glucose | 4.8 mmol/l (3.5-5.5) |

Which of the following would be the most appropriate initial treatment for this patient?

- ○ 100mg IV hydrocortisone stat
- ○ 150 mls of 3% hypertonic saline given over 20 mins
- ○ 1g phenytoin IV over 30 mins
- ○ 1l N saline over 4 hrs
- ○ Fluid restriction to 500 mls per day

Ufone 4:57 PM 68%
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150 mls of 3% hypertonic saline given over 20 mins ← Correct answer 72%

1g phenytoin IV over 30 mins 0%

1l N saline over 4 hrs ✖ 5%
Incorrect answer selected

Fluid restriction to 500 mls per day 21%

This patient appears to have developed a hyponatraemic encephalopathy associated with the severe and acute hyponatraemia. This seems likely due to either SIADH or indeed cerebral salt wasting. In this scenario, the acute development of hyponatraemia results in cerebral oedema associated with an osmotic influx of water into the brain cells and swamping of the counter – regulatory sodium-potassium pump. The resulting cerebral oedema is life threatening and manifests as headache, drowsiness, seizure and potentially death. Therefore, urgent treatment is required and guidance recommends rapid increase in sodium by approx 5 mmol/l through use of 150 ml boluses of 3% hypertonic saline.M

Steroids will not help in this scenario despite the cerebral oedema. The patient does not have hypoadrenalism as reflected by normal potassium and blood pressure.

**Reference**

Ufone 5:06 PM 73%
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A 78 year old lady with rheumatoid arthritis and type 2 diabetes mellitus presents with a chesty productive cough. Her medications include Metformin 1g bd, Methotrexate 15mg weekly, Folic acid 5 mg daily, and Prednisolone 5mg od. She is treated at home for a chest infection with a one week course of amoxycillin and makes a good recovery. Six weeks later she presents with severe lower lumbar back pain and is noted to have a temperature of 37C, a pulse of 100 bpm and a blood pressure of 138/78 mmHg. She is noted to have a left foot drop and a rash over the left shin which is waxy brown-yellow in colour.

Her investigations reveal:

| | | |
|---|---|---|
| **Haemoglobin** | 12.9 g/dL | (13 - 18 g/dL) |
| **WBC** | 15.3 $x10^9$/L | (4 -11 $x10^9$/L) |
| **Neutrophils** | 12.1 x $10^9$/L | (2 - 8 $x10^9$/L) |
| **Platelets** | 514 $x10^9$/L | (150 - 400 $x10^9$/L) |
| **CRP** | 53 mg/L | (< 10 mg/L) |
| **ESR** | 74 mm/hr | (< 40 mm/hr) |
| **Ig M** | 2.4 g/L | (0.4 -2.3 g/L) |
| **Ig A** | 7.8 g/L | (0.6 -5.0 g/L) |
| **Ig G** | 12.1 g/L | (6.0 - 15.6 g/L) |

Serum Electrophoresis - increased alpha and beta globulins, no paraprotein detected.
Urine electrophoresis - Bence jones protein not detected

Lumbar spine X ray - Mild degenerative lumbar

| | | |
|---|---|---|
| **Ig G** | 12.1 g/L | (6.0 - 15.6 g/L) |

Serum Electrophoresis - increased alpha and beta globulins, no paraprotein detected.
Urine electrophoresis - Bence jones protein not detected

Lumbar spine X ray - Mild degenerative lumbar spondylotic changes.
Chest X Ray - Clear lung fields.

Which of the following is the most likely diagnosis?

- Infective discitis
- Lumbar spondylosis
- Multiple myeloma
- Osteoporotic fracture
- Rheumatoid vasculitis

Infective discitis ✔ Correct

answer selected

- Lumbar spondylosis 1%
- Multiple myeloma 3%
- Osteoporotic fracture 2%
- Rheumatoid vasculitis 39%

This lady has risk factors for infection - Type 2 Diabetes Mellitus and immunosuppression with methotrexate for rheumatoid arthritis. Probable haematogenous spread of infection after the recent chest infection, seems the most probable cause of the presentation, resulting in seeding of the infection at the lumbar intervertebral disc. She has nerve root signs at L4/5 with weak tibialis anterior affecting ankle dorsiflexion. Incidentally, the rash is the description of necrobiosis lipoidica diabeticorum, and not erythema nodosum or a vasculitis rash. Less than 50% of infective discitis patients have fever. Urgent MRI imaging is first choice here. CT guided biopsy can help to identify an organism if blood cultures remain negative, but only in 50% of cases. Staph. aureus and coagulase negative Staphylococci are the most common organisms. Tuberculosis should always be considered on the list of differential diagnoses in

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A 44 year old male with a long history of epilepsy and associated learning difficulties was admitted as his carers felt that he was more subdued and unwell. There was little history to obtain directly although his carers stated that he was normally much brighter and communicative. He was taking Omeprazole for GORD, Thyroxine, Olanzapine, Co-codamol on a PRN basis, Topirmate and had recently been prescribed Co-trimoxazole by his GP for assumed UTI.

On examination, he appeared subdued and uncommunicative with a GCS of 15. His temperature was 37.2C, blood pressure 118/72 mmHg, pulse of 110 bpm, oxygen saturations of 98% on air and a respiratory rate of 30/min. No specific signs were noted on examination of the chest, praecordium or abdomen. No focal neurology was noted.

Investigations revealed:

| | |
|---|---|
| **FBC** | Normal |
| **Sodium** | 144 mmol/l (134 - 144) |
| **Potassium** | 3.9 mmol/l (3.5 - 5) |
| **urea** | 10.2 mmol/l (3 - 8) |

Ufone 10:48 PM 100%
studyprn.com

| | |
|---|---|
| **Creatinine** | 140 micromol/l (50 - 100) |
| **Chloride** | 122 mmol/l (95 - 105) |
| **Fasting Plasma Glucose** | 7.8 mmol/l (3.5 - 5.6) |
| **pH** | 7.12 (7.35 - 7.45) |
| **Standard bicarbonate** | 11 mmol/l (22 - 28) |
| **pCO2** | 4.2 kPa (4.5 - 6) |
| **pO2** | 14.5 kPa (10 - 13) |
| **Lactate** | 1.2 mmol/l (0.5 - 1.5) |

Which of the following is the likely diagnosis?

- ○ Co-trimoxazole induced acidosis
- ○ Diabetic ketoacidosis
- ○ Methanol consumption
- ○ Olanzapine induced acidosis
- ○ Topiramate induced acidosis

Co-trimoxazole induced acidosis 44%

Diabetic ketoacidosis 5%

Methanol consumption ✖ 12%

Incorrect answer selected

Olanzapine induced acidosis 13%

Topiramate induced acidosis ← 26%

Correct answer

The patient has a hyperchloraemic acidosis with a normal anion gap {sodium – (bicarboinate+chloride) = 11 – NR 8-16}. In this case the normal anion gap would exclude all the typical causes as found with high anion gap – lactic acidosis, DKA, methanol etc (A useful mnemonic for high anion gap metabolic acidosis is MUDPILES). Loss of bicarbonate ions is often a cause of normal anion gap acidosis – renal tubular acidosis. In our case, Topiramate causes a type 2 RTA and loss of bicarbonate ions. Acetazolamide, fistulas, hyperparathyroidism are all capable of producing a normal anion gap acidosis.

An 18 year old student presents to A&E after just arriving from a beach holiday. She uses an insulin pump to manage her type 1 diabetes. She started feeling unwell whilst flying back home. She denies any fever or gastrointestinal symptoms. She has judiciously used the pump and only took it off whilst she went swimming. She has even changed the injection site and needle in flight as her blood glucose was 20mmol/L.

On admission to A&E her blood tests were as below:

Blood glucose: 36mmol/l (3.5-5.5)

Blood ketones: 5.4mmol (<1.5)

PH: 7.18

$HCO_3$: 8.1

What is the likely reason for developing DKA?

- ○ Blocked tubing due to air trapping in infusion set
- ○ Change in the size of Cannula should be done if persistent hyperglycaemia
- ○ Increase in the insulin dose was not done whilst in warm country
- ○ Insulin in the cartridge may have degraded due to high temperature and was ineffective
- ○ She may have been off her insulin pump for a longer period

Blocked tubing due to air trapping in infusion set 31%

Change in the size of Cannula should be done if persistent hyperglycaemia 1%

Increase in the insulin dose was not done whilst in warm country 3%

Insulin in the cartridge may have degraded due to high temperature and was ineffective ✔ Correct answer selected 52%

She may have been off her insulin pump for a longer period 12%

There are several reasons for worsening glycaemic control and recognition of the cause is vital to early intervention. High temperatures and exposure to light increase the degradation of insulin to transformation products (deaminated insulin, covalent dimers, and higher oligomers) and increase formation of fibrils, potentially causing a loss in biological potency.

Question ID #3537

A 31 year old woman who is 11 weeks pregnant presents with tachycardia, tremors and palpitations. She has strong family history of autoimmune thyroid disease and goitre. Her thyroid function test results are as shown below:

| | | |
|---|---|---|
| **Free $T_4$** | 32.8 pmol/L | (9-23) |
| **Free $T_3$** | 11.2 pmol/L | (3.5-6.5) |
| **TSH** | < 0.01 mU/L | (0.35-5.5) |

What is the best therapeutic option in her case?

- Carbimazole
- Lugols iodine
- Propanolol
- Propylthiouracil
- Radioiodine

| | |
|---|---|
| Lugols iodine | 1% |
| Propanolol | 9% |
| Propylthiouracil ✔ Correct answer selected | 76% |
| Radioiodine | 0% |

The patient is likely to have Graves` thyrotoxicosis as suggested by features of hyperthyroidism and associated strong family history of autoimmune thyroid disease. In view of her pregnant state, treatment with lowest dose of Propylthiouracil, which renders her euthyroid, should be initiated. The following are few of the salient points to be remembered as far as pregnancy and thyroid dysfunction is concerned:

- Thyroxine requirement increase in hypothyroid women during first trimester of pregnancy.
- TSH levels increase during $2^{nd}$ and $3^{rd}$ trimester of pregnancy.
- Hyperthyroidism in pregnancy is commonly due to Graves` disease (d/d hyperemesis gravidarum, H mole), so check TSH receptor antibodies (TRAb) in all such patients.
- Graves` disease can relapse during first trimester and post partum period (more likely to remit during $2^{nd}$ and $3^{rd}$ trimester)
- Check TRAb in third trimester, as it can be transmitted through placenta to baby, leading to neonatal hyperthyroidism
- Treat maternal hyperthyroidism with lowest possible dose of PTU (more protein bound, less transfer across placenta)

An 18-year-old young lady is admitted to the acute medical unit with nausea, vomiting and abdominal pain. She gives a history of approximately 5 kg weight loss over the past month to two months and also complains of persisting thirst and polyuria over the last 2 weeks. On examination her blood pressure is 105/65 mmHg, her pulse is 92 beats per minute and her and her body weight is 64.8 kg.

Investigations reveal:

| | Test Results | Normal Range Examples |
|---|---|---|
| **Plasma glucose** | 21.7 mmol/l | 3.5 - 5.5 |
| **pH** | 7.03 | 7.35 - 7.45 |
| **pCO2** | 2.9 Kpa | 4.6 - 6 |
| **pO2** | 15.6 Kpa | 11.1 - 14.4 |
| **Bicarbonate** | 4.6 mmol/l | 22 - 27 |
| **Haemoglobin** | 14.9 g/dl | 12 - 16 |
| **WCC** | 17.9 X $10^9$/L | 4 - 11 |

Which of the following is the most appropriate management of this patient?

- ○ Initiate fixed dose basal bolus SC insulin doses
- ○ Initiate IV fixed dose insulin regime (0.1 u/kg)
- ○ Initiate IV sliding scale insulin only
- ○ Initiate one stat dose of IV rapidly acting insulin (0.1 u/kg) followed by sliding scale insulin

Initiate IV fixed dose insulin regime (0.1 u/kg) ← Correct answer 72%

Initiate IV sliding scale insulin only 5%

Initiate one stat dose of IV rapidly acting insulin (0.1 u/kg) followed by sliding scale insulin ✖ Incorrect answer selected 17%

Initiate sliding scale insulin with one dose of sc long acting insulin glargine (0.1 u/kg) 4%

Fluid replacement is the cornerstone of therapy in the management of diabetic ketoacidosis (DKA). The total body deficit of fluid is around 5 - 8 litres and rehydration by reopening renal perfusion may on its own reduce blood glucose by up to 2%. Infusion of large quantities of hyptonic fluid may result in circulatory collapse and possible cerebral oedema. Consequently most authorities recommend initial hydration with 0.1554 mol /l saline, switching to hypotonic saline or dextrose if plasma sodium rises beyond 155 mmol/l. Current practice advocates fluid replacement at a rate of 2 litres over 4 hours, 2 litres over 8 hours and subsequently 1 litre every 8 hours. This rate of rehydration results in slower increases in sodium and chloride concentrations. Once the glucose has fallen to around 14 mmol/l, infusion of 10% glucose should be substituted for saline. This will allow continued infusion of insulin to correct metabolic acidosis and ketosis. Saline may be given simultaneously if the patient is still dehydrated. Administration of bicarbonate is not without risk: local irritation, hypokalaemia, rebound alkalosis and cerebral oedema are all potential consequences. Thus bicarbonate is generally only given in profound acidosis when the PH is < 6.9. Neutrophilia is a recognised acute response to ketoacidosis and antibiotics should only be administered if an infective aetiology or focus can be identified. As a result of both acidosis and insulin deficiency there is a total body potassium deficit of up to 1000 mmol, hence with rehydration, insulin replacement and correction of acidosis resulting in further potassium loss with restoration of urine flow, hypokalaemia is a major cause of death in ketoacidosis. The standard approach to insulin administration is using a fixed dose insulin regime rather than sliding scale insulin.

Joint British Society Guidelines

A 62 year old woman is admitted to MAU through her GP as she has become increasingly unwell over the last few days. She is lethargic, has had occasional episodes of abdominal pain, and is clinically dehydrated. She has a recent history of metastatic breast cancer with bony involvement, for which she is receiving palliative treatment. Her results reveal:

| | |
|---|---|
| Sodium | 144 mmol/l (134-144) |
| Potassium | 3.1 mmol/l (3.5-5.5) |
| Calcium | 4.1 mmol/l (2.2-2.6) |

Which of the following would you expect to find on the ECG?

- ○ Prolonged PR Interval
- ○ QT shortening
- ○ ST elevation
- ○ Tall tented T waves
- ○ Widened QRS complexes

QT shortening ✔ Correct answer selected — 72%

ST elevation — 0%

Tall tented T waves — 0%

Widened QRS complexes — 12%

The predominant abnormality here will relate to the markedly elevated calcium, not the mild hypokalaemia. The QT interval is typically shortened in hypercalcaemia. Other features in severe hypercalcaemia include J waves and bizarre QRS appearance.

A 26-year-old lady is reviewed in the clinic. She has a 10 year history of type 1 diabetes and admits to frequently missing insulin doses. Her current medication includes insulin glargine 42 units at night and Novorapid 12 units prior to each meal. On examination her BMI is 21 $kg/m^2$ her blood pressure is 105/65 mmHg.

Investigations reveal:

| | Test Results | Normal Range |
|---|---|---|
| **Hba1c** | 10.8% | <6 |
| **Total Cholesterol** | 4.1 mmol/l | <5 |
| **Plasma triglyceride** | 1.9 mmol/l | (0.9 - 2.2) |
| **TSH** | 0.65 mu/l | (0.32 - 5.5) |
| **Urine Ketones** | +++ | |
| **Urine Glucose** | +++ | |

Which of the following is a feature of urine ketone testing?

- ○ Heavy ketonuria implies the need for insulin initiation when identified in patients with type 2 diabetes
- ○ Ketonuria correlates closely with degree of acidosis in diabetic ketoacidois
- ○ Ketonuria resolves with correction of acidosis in diabetic ketoacidosis
- ○ Urine ketone sticks measure acetoacetate in the urine
- ○ Urine ketone sticks measure betahydroxybutyrate levels in the urine

Ketonuria correlates closely with degree of acidosis in diabetic ketoacidois

11%

Ketonuria resolves with correction of acidosis in diabetic ketoacidosis

13%

Urine ketone sticks measure acetoacetate in the urine ✔ Correct answer selected

50%

Urine ketone sticks measure betahydroxybutyrate levels in the urine ✖ Incorrect answer selected

18%

Urine ketone testing measures acetoacetate in urine which is produced by metabolism of betahydroxybutyrate. Ketonuria persists despite correction of acidaemia in patients with ketoacidosis and does not correlate with the degree of acidosis. Ketonuria is not a marker of absolute insulin deficiency and may occur as a normal response to exercise or fasting.

An 81 year old man is admitted acutely with a week history of feeling increasingly unwell and weak. He has a history of type 2 diabetes for which he takes metformin 1g bd and gliclazide 80mg bd. His last HbA1c was 10.1%. He also takes Ramipril and simvastatin.

On examination he appears dehydrated and unwell. His temperature is 37C , blood pressure 116/70 mmHg and a pulse of 102 bpm. Oxygen saturation is 98% on air and he has a respiratory rate of 22/min.

Blood results reveal:

| | |
|---|---|
| Sodium | 155 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 20.5 mmol/l (3-8) |
| Glucose | 37.2 mmol/l (3.5-5.5) |
| pH | 7.35 (7.35-7.45) |
| Bicarbonate | 18 mmol/l (22-28) |
| Ketones | 1.8 mmol/l (<1.5) |

Which of the following is the likely diagnosis?

- ○ Acute kidney injury associated with ACE inhibitor
- ○ Diabetic Ketoacidosis
- ○ Hyperosmolar Hyperglycaemic State
- ○ Severe dehydration with acute kidney injury
- ○ Type B lactic acidosis associated with metformin

An 18 year old woman was admitted to HDU for further management of diabetic ketoacidosis. She had 2 episodes of generalised tonic clonic seizures and became unresponsive after 3 hours of treatment as per a DKA pathway. On examination, she was slightly built, her pupils were equal and reactive to light. She had received 5mgs of diazepam and was post ictal. Her current blood glucose is 20mmol/L (initially 40mmol/L) and blood ketones are 3.2mmol (<1.5). Which of the following is the next step in management?

- ○ Give 150mls hypertonic saline over 10mins
- ○ IV Phenytoin and CT head
- ○ Reduce IV fluids infusion rate and arrange urgent CT head
- ○ Start IV cefotaxime and do Lumbar Puncture to rule out encephalitis
- ○ Stop IV fluids and give IV mannitol

Acute kidney injury associated with ACE inhibitor — 1%

Diabetic Ketoacidosis — 3%

Hyperosmolar Hyperglycaemic — 90%

State ✔ Correct answer selected

Severe dehydration with acute kidney injury — 3%

Type B lactic acidosis associated with metformin — 3%

The most likely diagnosis is HHS as plasma osmolality 376 mosmol/l with glucose above 33, bicarbonate above 15 and a pH >7.3. A trace of ketones may be noted (<3).

Reduce IV fluids infusion rate and arrange urgent CT head ✔ Correct answer selected — 59%

Start IV cefotaxime and do Lumbar Puncture to rule out encephalitis — 2%

Stop IV fluids and give IV mannitol — 20%

Cerebral oedema is a recognised complication in children, adolescents and adults with low body mass index. It can happen with large volume fluid resuscitation in DKA. Several mechanisms including vasogenic odema (damage to blood brain barrier), due to rapid changes in the osmolality with fluid therapy, and interventions like bicarbonate therapy, are thought to be the cause of cerebral oedema. In this scenario, one would initially reduce the rate of fluids and get a CT scan to confirm the diagnosis. This would take minutes and in the current litigious environoment, confirmation and exclusion of other diagnoses is important. Mannitol is also then a useful agent in this setting.

Ufone 11:27 AM 61%
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You are called via the arrest bleep to a 43 year old woman who is on the surgical ward. She had a laparoscopic cholecystectomy performed two days ago and has since had nausea and vomiting and has been receiving IV dextrose. It transpires that she had a fit for which the nursing staff requested the arrest team. She is now drowsy. Her past medical history is unremarkable and U&E prior to surgery were reported to be within normal range.

On examination, she is drowsy with a GCS of 13. Her pulse is 88 bpm and blood pressure 132/88 mmHg with oxygen sats of 100% on air. There is no focal neurology and her plantar responses are equivocal.

Of note, her blood results reveal:

| | |
|---|---|
| Sodium | 118 mmol/l (135-144) |
| Potassium | 3.5 mmol/l (3.5-5) |
| Urea | 3.8 mmol/l (3-8) |
| Creatinine | 70 micromol/l (50-100) |
| Glucose | 4.1 mmol/l (3.5-6) |

Which of the following is the most appropriate initial treatment for this patient?

- ○ 15mg oral Tolvaptan
- ○ 100mg IV Hydrocortisone stat
- ○ 150mls of 3% hypertonic saline over 20 mins
- ○ 1litre Normal saline infused over 4 hrs
- ○ Fluid restriction to 500mls per day

Ufone 11:37 AM 60%
studyprn.com

- 100mg IV Hydrocortisone stat — 3%
- 150mls of 3% hypertonic saline over 20 mins ✔ Correct answer selected — 84%
- 1 litre Normal saline infused over 4 hrs — 7%
- Fluid restriction to 500mls per day — 5%

This patient is likely to have hyponatraemic encephalopathy which is life threatening and has presented with a fit. Post-operative hyponatraemia is not uncommon and is likely to be due to a combination of SIADH which develops in the post-op period and the infusion of inappropriate IVIs. The European Endocrine Society Guidelines on severe hyponatraemic encephalopathy recommend a rapid correction of sodium by approximately 5 mmol/l. This can ameliorate the cerebral oedema that underlies this disorder. It is believed that with severe or moderately severe symptoms, the risk of brain oedema outweighs the risk of osmotic demyelination syndrome.

A 62 year old woman is referred to the medical intake with tingling and paraesthesia. The patient has been aware of deteriorating symptoms for one week. The GP asks whether this is a stroke. She has a background history of type 2 diabetes, hypertension and GORD for which she takes omeprazole, metformin, sitagliptin, simvastatin, Ramipril and amlodipine. On examination there is little of note.

Investigations reveal:

| | |
|---|---|
| Calcium | 2.06 mmol/l (2.2-2.6) |
| Magnesium | 0.3 mmol/l (0.7-1) |
| LFTs | Normal |

You see on the computer that a 25OHD level checked 1 month before by the GP reveals a level of 18 nmol/l (>50)

Which of the following is the likely cause of this patient's presentation?

- ○ Diabetic autonomic neuropathy
- ○ Metformin
- ○ Omeprazole
- ○ Sitagliptin
- ○ Vitamin D deficiency

A 38 year old man with type 1 diabetes with CKD attends the clinic with an HbA1c of 88mmol/mol (<60). 2 months ago it was 54mmol/mol. Preparations for renal replacement therapy were initiated during his recent renal consultation. He was worried about long term haemodialysis. His current medications include insulin glargine 18 units at night, novorapid 8 units tds, alfa-calcidol, epoetin injections, aspirin and omeprazole. He continues to monitor his blood glucose and follows appropriate dietary management. Which of the following can explain his worsened HbA1c value?

- ○ Alfacalcidol
- ○ Erythropoeitin therapy
- ○ Haemolysis due to uraemia
- ○ Increased insulin requirements due to CKD
- ○ Stress hyperglycaemia

| | |
|---|---|
| Diabetic autonomic neuropathy | 4% |
| Metformin | 6% |
| Omeprazole ✔ Correct answer selected | 25% |
| Sitagliptin | 7% |
| Vitamin D deficiency | 58% |

This patient has a hypocalcaemia associated with a severe hypomagnesaemia. This is likely due to the omeprazole, which results in increased GI magnesium losses. The hypomagnesaemia impairs the calcium sensing on the parathyroid cells; hence, this results in an induced hypoparathyroidism with hypocalcaemia. It is a good diagnosis to make but is often not appreciated.

This is not due to vitamin D deficiency as with osteomalacia the 25OHD would be lower, ALP raised and the patient would likely have a proximal

A 28 year old female who is 30 weeks pregnant presents with profound tiredness and lethargy. She is noted to have a sodium of 130 mmol/l on routine testing and this sparks further investigation.

Her investigations reveal:

| | |
|---|---|
| **Cortisol post short synacthen test** | 252 nmol/l (>550) |
| **Free thyroxine** | 5.5 pmol/l (9-22) |
| **TSH** | 2.2 mu/l (0.5 - 5) |
| **Prolactin** | 3300 m/l (<450) |
| **estradiol** | 1300 pmol/l (130 - 800) |
| **LH** | 1.1 mu/l (2 - 10) |
| **FSH** | 1.0 mu/l (2 - 10) |

An MRI of the pituitary is performed which reveals enlargement of the pituitary bulging slightly beyond the sellar but with no obvious tumour.

Which of the following is the likely diagnosis?

- ○ Dysgerminoma
- ○ Lymphocytic hypophysitis
- ○ Non-functioning pituitary tumour
- ○ Prolactinoma
- ○ Silent pituitary infarction

| | |
|---|---|
| Alfacalcidol | 2% |
| Erythropoeitin therapy ← Correct answer | 50% |
| Haemolysis due to uraemia | 17% |
| Increased insulin requirements due to CKD | 9% |
| Stress hyperglycaemia ✖ Incorrect answer selected | 22% |

| | Increased HbA1c | Decreased HbA1c | Variable HbA1c |
|---|---|---|---|
| Red cell lifespan | Increased red cell survival: Previous splenectomy<br>Iron deficiency anaemia<br>Erythropoietin<br>B12 treatment<br>Iron treatment<br>Erythropoiesis reduction | Red cell destruction:<br>Splenomegaly<br>Rheumatoid arthritis<br>Haemolysis<br>Ribavirin or antiretrovirals | Haemoglobinopathies<br>Hb F<br>MetHb |
| Glycation | Alcoholism Chronic renal failure | Aspirin Vitamin C and E<br>Haemoglobinopathies | Genetic heterogeneity |
| Analytical interference | Hyperbilirubinaemia<br>High dose aspirin<br>Opiates<br>Carbamylated Hb | Hypertriglyceridaemia | Haemoglobinopathies |

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- ○ Silent pituitary infarction

Psychosocial **stress** may be a cause of **increased HbA1c**. intimation a very likely cause of elevated **HbA1c**: psychosocial **stress**. animals as well as in type 1 and type 2 diabetic patients

| | |
|---|---|
| Dysgerminoma | 3% |
| Lymphocytic hypophysitis ← Correct answer | 16% |
| Non-functioning pituitary tumour ✖ Incorrect answer selected | 21% |
| Prolactinoma | 39% |
| Silent pituitary infarction | 22% |

This pregnant woman presents in the third trimester with a hyponatraemia, secondary hypothyroidism, an appropriate prolactin and oestradiol concentrations for this stage of pregnancy and an inadequate cortisol response to synacthen. This suggests partial hypopituitarism during the latter stages of pregnancy which is likely due to lymphocytic hypophysitis (LH). The exact cause of LH is unknown but is thought to be autoimmune-related. Some patients will recover either spontaneously or with a short course of steroids, others may have a more protracted course. The condition often presents in late pregnancy or the postpartum period. Even without the MRI, pituitary tumour is unlikely as the patient became pregnant - unlikely if there was pre-existent hypopituitarism associated with a pituitary tumour either functional or non-functional.

An Asian man is admitted with a history of weight loss, lethargy, nausea and vomiting. On examination he looks dehydrated and pigmented. His biochemical profile is as shown below:

| | | |
|---|---|---|
| **Sodium** | 124 mmol/L | (135-145) |
| **Potassium** | 5.6 mmol/L | (3.5-5.5) |
| **Urea** | 30 mmol/l | (7-20) |
| **Creatinine** | 104 µmol/L | (60-115) |
| **9 am cortisol** | 55 nmol/L | |
| **30 min cortisol** | 220 nmol/L | (Post ACTH injection) |

The CT image shows the presence of calcification within the adrenal gland. What is the likely aetiology of his adrenal insufficiency?

- ○ Adrenal leukodystrophy
- ○ Adrenal tuberculosis
- ○ Histoplasmosis
- ○ Metastatic disease
- ○ Sarcoidosis

Adrenal leukodystrophy 4%

Adrenal tuberculosis ✔ Correct 88%

answer selected

Histoplasmosis 2%

Metastatic disease 2%

Sarcoidosis 4%

Adrenal tuberculosis remains one of the commonest causes of adrenal insufficiency in the developing world with about 5% of the patients with disseminated tuberculosis (Miliary Koch's) developing significant adrenal insufficiency. A low threshold of suspicion to seek adrenal insufficiency is warranted in patients with tuberculosis as the symptoms and signs are non specific and at times are attributed to underlying condition (Tuberculosis). Adrenal tuberculosis is reversible with anti-tuberculosis medications if these are given at an early stage of the disease.

A 46 year old man presents to the MAU jaundiced. He has known chronic liver disease and continues to drink to excess. He is jaundiced and unwell. On examination, he has no evidence of ascites but does have some tenderness in the right upper quadrant. You clinically suspect he has alcoholic hepatitis.

His blood results show:

| | | |
|---|---|---|
| Haemoglobin | 13.1 | Normal range (130-180 g/l) |
| White cell count | 12.9 | Normal range (4.0-11.0 x$10^9$/L) |
| Mean Cell Volume | 108 | Normal range (80-100 fL) |
| Platelets | 78 | Normal range (150-400 x$10^9$/L) |
| Bilirubin | 189 | Normal range (<21 umol/L) |
| Alkaline phosphatase | 180 | Normal range (30-150 U/L) |
| Alanine transferase | 360 | Normal range (<59 U/L) |
| Prothrombin time | 28.2 | Normal range (9.0-13.0 SEC) |

Which of the following scoring systems best determines the longer-term prognosis of his underlying chronic liver disease?

- ○ Child-Pugh score
- ○ Glasgow alcoholic hepatitis score
- ○ Glasgow Blatchford score
- ○ Hepatitis Discriminant function
- ○ Rockall score

StudyPRN

# Acute Medicine SCE Revision Gastroenterology and hepatology

Course overview | Start

| Status | Question |
| --- | --- |
| | A 46 year old man presents to the MAU j |
| | A 58 year old man was admitted with ha |
| | A 62 year old woman is referred to the m |
| | You are called to see an 82 year old man |

| | | |
|---|---|---|
| Child-Pugh score ✔ Correct answer selected | | 53% |
| Glasgow alcoholic hepatitis score | | 22% |
| Glasgow Blatchford score | | 0% |
| Hepatitis Discriminant function | | 23% |
| Rockall score | | 1% |

This Is the only score system in the list used for assessing chronic liver disease. The Glasgow alcoholic hepatitis score and discriminant function can both be used to assess prognosis and guide treatment of acute alcoholic hepatitis, but have not been validated for chronic liver disease alone. The Blatchford score and Rockall score are used in gastrointestinal bleeding. Maddrey's Alcohol Discriminant Score provides a better approximate of the shorter term prognosis.

A 36 year old woman starts a new medication prescribed by her GP. Four weeks later she presents to A and E with severe abdominal pain and is diagnosed with acute pancreatitis.

The pancreatitis is thought to be secondary to the new medication; it is duly discontinued, and the pancreatitis resolves.

Six months later, the same medication is reinitiated and pancreatitis develops within 8 hours.

What is the mechanism causing this drug-induced pancreatitis?

- ○ Accumulation of toxic metabolite
- ○ Drug interaction
- ○ Hypersensitivity reaction
- ○ Immunomodulatory up-regulation
- ○ Intrinsic toxicity

| | |
|---|---|
| Drug interaction | 1% |
| Hypersensitivity reaction ✔ Correct answer selected | 35% |
| Immunomodulatory up-regulation | 42% |
| Intrinsic toxicity | 11% |

The case above displays a classic pattern of a hypersensitivity reaction, which is the most common cause of drug-induced pancreatitis. Drugs that operate through this mechanism include azathioprine, aminosalicylates, metronidazole, and tetracycline. Accumulation of a toxic metabolite and intrinsic toxicity often occur after a longer duration of initial drug use and do not occur as quickly with reinitiation. There is nothing in the history to suggest a drug interaction and Immunomodulatory up-regulation is not a pathogenetic mechanism of drug-induced pancreatitis.

Question ID #3948

Which of the following patients has the most valid indication for urgent assessment for potential liver transplantation?

- A 27 year old man with Wilson's disease and evidence of encephalopathy
- A 59 year old man with hepatocellular carcinoma with evidence of local extrahepatic spread
- A 38 year old woman with paracetamol overdose with an ALT of 3500 IU
- A 56 year old woman with cholangiocarcinoma
- An 82 year old woman with Worsening primary biliary cirrhosis and bilirubin over 100 IU

A 20-year-old otherwise healthy student presents with three months of abdominal pain, diarrhea, a 4kg weight loss, and diffuse arthropathy but no fevers. He has no travel history, takes no regular medication, is a nonsmoker, and his family history is significant only for an uncle who had "some bowel removed." His examination is remarkable for normal vital signs and right lower quadrant tenderness with no masses or organomegaly palpable.

What is the single next best test to confirm his diagnosis?

- Barium enema
- Capsule enteroscopy
- Colonoscopy with ileal intubation
- P-ANCA
- Stool studies

| | | |
|---|---|---|
| | Capsule enteroscopy | 12% |
| | Colonoscopy with ileal intubation ✔ Correct answer selected | 66% |
| ○ | P-ANCA | 0% |
| | Stool studies | 17% |

This patient has signs and symptoms consistent with ileal and right-sided colonic Crohn's disease. Although stool studies should be done as part of his evaluation, given the duration of symptoms, he is unlikely to have an infection. His significant weight loss is an indicator that more invasive testing is required. In patients with Crohn's disease, P-ANCA is associated with a UC-like phenotype, but this is not a diagnostic test. A barium enema may show inflammatory changes of the colon suggestive of Crohn's disease, but will not necessarily evaluate the terminal ileum, and biopsy specimens cannot be taken; barium enemas have been largely superseded by other imaging modalities in the UK. Capsule enteroscopy is highly sensitive in identifying the lesions of Crohn's disease, but is not specific and therefore should not generally be used as a first-line diagnostic study. Further, biopsy specimens cannot be taken, and the risk of capsule retention in the setting of a stricture can be as high as 25%. Colonoscopy with ileal intubation will not only allow macroscopic visualization of inflammatory changes in the colon and terminal ileum, but biopsies performed in both inflamed and noninflamed tissue will permit histologic mapping

A 38-year-old woman presents acutely to the MAU. A friend found her unconscious at home this morning. She was found with an empty bottle of paracetamol and 2 bottles of vodka. She was started on N acetyl cysteine in A&E and has been transferred through to you for medical assessment and management.

Her bloods show;

| | | |
|---|---|---|
| Haemoglobin | 12.1 | Normal range (130-180 g/l) |
| White cell count | 11.8 | Normal range (4.0-11.0 x$10^9$/L) |
| Mean Cell Volume | 96 | Normal range (80-100 fL) |
| Platelets | 300 | Normal range (150-400 x$10^9$/L) |
| Bilirubin | 215 | Normal range (<21 umol/L) |
| Alkaline phosphatase | 180 | Normal range (30-150 U/L) |
| Alanine transferase | 2690 | Normal range (<59 U/L) |
| Prothrombin time | 58.2 | Normal range (9.0-13.0 SEC) |

Arterial blood gas on air

pH 7.21 (7.34-7.44)

pO2 14.1kPa (11-13)

pCO2 3.9 kPa (3.4-4.4)

What is the most appropriate management at this point?

- ○ Add lactulose
- ○ Add Pabrinex
- ○ Add vitamin K
- ○ Refer for psychiatric assessment
- ○ Refer to liver centre for consideration of liver transplant

An elevated prothrombin time signifies liver failure in paracetamol overdose and is a marker of poor prognosis. However, arterial pH, creatinine and encephalopathy are also markers of a need for liver transplantation \

**Paracetamol overdose: management**

**King's College Hospital criteria for liver transplantation (paracetamol liver failure)**

Arterial pH < 7.3, 24 hours after ingestion

or all of the following:

- prothrombin time > 100 seconds
- creatinine > 300 µmol/l
- grade III or IV encephalopathy

Refer for psychiatric assessment 1%

Refer to liver centre for consideration of liver transplant ✔ Correct answer selected 92%

The King's College guidelines are the most widely used has published guidelines on when to refer for liver transplantation in paracetamol overdose and acute liver failure.

King's College Hospital criteria for transplantation in acute liver failure:

**Paracetamol**

+ pH <7.30 (irrespective of grade of encephalopathy)

+ Prothrombin time >100 seconds and serum creatinine >300 µmol/l if in grade III or IV coma

**Non-paracetamol**

+ Prothrombin time >100 seconds (irrespective of grade of encephalopathy) or

+ Any three of the following (irrespective of grade of encephalopathy):

- aetiology: non-A, non-B (indeterminate) hepatitis, halothane hepatitis, idiosyncratic drug reactions
- age <10 or >40 years
- jaundice to encephalopathy interval >7 days
- prothrombin time >50 seconds
- serum bilirubin >300 µmol/l

**Further Reading**

A 62-year-old man with alcoholic liver disease presents acutely unwell to the A&E. He is jaundiced and is behaving strangely. He keeps forgetting who you are as you take the history from him, and his speech is slurred. He has had chronic liver disease secondary to alcohol for many years according to his notes, and his medications are thiamine 50mg daily plus lactulose 10ml twice daily.

On examination, he is icteric and tremulous plus has evidence of asterixis. His abdomen is soft and non-tender, with no shifting dullness.

According to the West Haven Encephalopathy scale, what grade of encephalopathy does this patient have?

- Grade 0
- Grade 1
- Grade 2
- Grade 3
- Grade 4

A 40 year old Asian gentleman has been referred from the liver clinic where he is being treated for hepatitis C with pegylated interferon and ribavirin for the last 12 weeks. Over the last 3 weeks the patient has noted swelling of his ankles and feet along with shortness of breath on exertion. There is no history of a decrease in urine output, although he has noted frothing of urine.

On examination, he has a blood pressure of 130/80 mmHg, a pulse rate of 100/minute and a temperature of 38C. He has significant pedal edema. On chest examination, he has dull percussion note at both bases with decreased breath sounds and decreased vocal fremitus. On abdominal examination, there is no visceromegaly but shifting dullness is present.

Laboratory investigations reveal:

| | | |
|---|---|---|
| Hb | 11.6 g/dl | 13-18 g/dl |
| WBC | 9 x $10^9$/l | 4-11 x $10^9$/l |
| Platelets | 455 x $10^9$/l | 150-300 x $10^9$/l |
| PT | 12 seconds | 12-14 seconds |
| APTT | 34 seconds | 30-46 seconds |
| Urea | 23 mmol/l | 2.5-6.7 mmol/l |
| Serum creatinine | 488 mmol/l | 88-120 mmol/l |
| Bilirubin | 3 umol/l | 2-17 umol/l |
| ALT | 35 iu/l | 5-40 iu/l |
| Serum albumin | 22 g/l | 34-48 g/l |
| C3, C4 | Within limits | |
| Anti HCV | Positive | |
| HCV PCR RNA | Not detected | |
| HBsAg | Negative | |

Urine Analysis

| | | |
|---|---|---|
| Blood | Nil | |
| Protein | ++++ | (24 hours quantification: 6.7g) |
| Glucose | + | |
| Microscopy | Few hyaline casts | |

What is the most likely diagnosis?

- ○ Amyloidosis
- ○ Diabetic nephropathy
- ○ HCV related cryoglobulinemia
- ○ HCV related membranoproliferative glomerulonephritis
- ○ Interferon induced focal segmental glomerulosclerosis

HCV related cryoglobulinemia 25%

HCV related membranoproliferative glomerulonephritis 43%

Interferon induced focal segmental glomerulosclerosis ✔ Correct answer selected 26%

The main causes of nephrotic range proteinuria include diabetic nephropathy, minimal change disease, focal segmental glomerulosclerosis, membranous nephropathy and amyloidosis. Hepatitis C related renal disease manifests as either membranoproliferative glomerulonephritis, membranous nephropathy or cryoglobulinemia. The mainstay treatment in all 3 cases remains treatment of hepatitis C itself with a target of achieving seroconversion. Considering seroconversion is achieved in this case the diagnosis is unlikely to be one of these 3 options. Interferon therapy is known to cause focal segmental glomerulosclerosis with mainstay treatment being removal of offending agent.

A 72 year old woman is admitted by her GP with a history of fatigue and weakness which had deteriorated over the last month. The GP had checked her bloods and discovered a haemoglobin of 6.7 g/dl (12-16) with an MCV of 59 fl. She had a past history of type 2 diabetes for which she takes metformin 500 mg bd and her most recent HbA1c checked 2 weeks ago was 68 mmol/mol (<48). She also has a history of previous DVT and atrial fibrillation with arterial embolism for which she had required a left below knee amputation. Consequently she remains on lifelong warfarin. She takes bisoprolol 2.5 mg/d, ramipril 2.5 mg daily, omeprazole 40mg daily, ferrous fumarate 210mg bd and simvastatin 40mg daily.

She describes feeling weak and lethargic over the last month, which has culminated in her seeing her GP. She denies any abdominal pains and has been unaware of any melaena or PR blood loss. She denies any weight loss. There was some story about iron deficiency a year or so ago for which she had been prescribed iron tablets. There was nothing on the clinical portal about this.

On examination, she is comfortable but appears pale. Her BMI is 32.2 kg/m2. Her pulse is 70 bpm irregular and blood pressure is 110/70 mmHg. There is nothing to find on examination other than she having a below knee amputation and PR examination is normal.

nothing on the clinical portal about this.

On examination, she is comfortable but appears pale. Her BMI is 32.2 kg/m2. Her pulse is 70 bpm irregular and blood pressure is 110/70 mmHg. There is nothing to find on examination other than she having a below knee amputation and PR examination is normal.

Other than the above all other results are normal including U+Es and LFTs. Ferritin was 10 microg/l (30-100) and INR was 2.5. Chest x-ray is normal.

Which of the following is the most appropriate management strategy for this patient?

- ○ Give IV iron and arrange outpatient upper and lower GI studies
- ○ Increase dose of iron, stop warfarin and discharge with OPD upper and lower GI studies
- ○ Transfuse, continue warfarin and arrange OPD upper and lower GI studies
- ○ Transfuse, stop her warfarin and arrange inpatient upper and lower GI studies
- ○ Transfuse, stop her warfarin and arrange outpatient endoscopy

Give IV iron and arrange outpatient upper and lower GI studies 18%

Increase dose of iron, stop warfarin and discharge with OPD upper and lower GI studies ✖ Incorrect answer selected 5%

Transfuse, continue warfarin and arrange OPD upper and lower GI studies ← Correct answer 34%

Transfuse, stop her warfarin and arrange inpatient upper and lower GI studies 40%

Transfuse, stop her warfarin and arrange outpatient endoscopy 3%

This lady has an iron deficiency anaemia which appears to be long standing as she is haemodynamically stable and has no overt source of bleeding. The likely source is therefore diverticular disease or malignancy, which seems less likely in view of the normal weight and lack of GI symptoms. The issue is further complicated by the fact that she needs to be anticoagulated which is required lifelong due to the embolism and previous DVT. Therefore, on balance warfarin should continue, the patient should be transfused for symptomatic improvement and the dose of iron can be increased. The patient can then be discharged with assessment of Hb to ensure stability and GI studies organised as an outpatient – CT colonogram initially and endoscopy.

Ufone 7:15 PM 100%
studyprn.com

Question ID #3759

A 24 year old woman is admitted with an 8 hour history of abdominal pain. The pain began at approximately 1am as an epigastrium pain, which was relatively constant, though it had some colicky features to it in that it grew in intensity on occasions and then subsided a little. She felt nauseous with the pain but had not vomited. After enduring the pain for a few hours she went to hospital.

In her past history, she was diagnosed with Crohn's disease and had been on infliximab for the last 5 years. She had been in remission since then. Other than infliximab she took the combined oral contraceptive.

She had opened her bowels normally the morning beforehand, was unaware of any diarrhoea or blood in her motion. She denied eating anything that upset her stomach, or so she thought. She is currently having a withdrawal menstrual bleed having regularly taking the OCP.

On examination, she was tearful, had a pulse of 82 bpm, a blood pressure of 122/80 mmHg and a temperature of 37.7C. Examination of the abdomen revealed some tenderness in the epigastrium with more tenderness and guarding in the right iliac fossa. No abnormality was noted on PR examination.

Investigations reveal:

epigastrium with more tenderness and guarding in the right iliac fossa. No abnormality was noted on PR examination.

Investigations reveal:

| | |
|---|---|
| Haemoglobin | 13.3 g/dl (12-16) |
| White count | 9.4 $x10^6$/l (3-10) |
| Platelets | 154 $x10^6$/l (140-400) |
| U+Es | Normal |
| CRP | 5mg/l (<5) |

Which of the following is the most appropriate investigation for this patient?

- ○ Beta-HCG estimation
- ○ CMV PCR on serum
- ○ Colonoscopy with biopsy
- ○ Sigmoidoscopy
- ○ Ultrasound abdomen and pelvis

Which of the following is the most appropriate investigation for this patient?

Peer responses

| | |
|---|---|
| Beta-HCG estimation | 39% |
| CMV PCR on serum | 4% |
| Colonoscopy with biopsy | 3% |
| Sigmoidoscopy | 0% |
| Ultrasound abdomen and pelvis ✔ Correct answer selected | 54% |

This young woman with a history of Crohn's disease that has been well controlled and in remission, presents with a short history of abdominal pain that began in the abdomen and shifted to become more apparent in the right iliac fossa. This together with the low grade fever, low CRP and WCC suggests a diagnosis of appendicitis. CT or USS can assist in the diagnosis and may reveal appendicular inflammation with fluid. Generally in the UK USS would be the initial investigation then CT or MRI. The differential would include ectopic pregnancy but in this case the history is more in keeping with appendicitis, the patient is taking the oral contraceptive and is having a withdrawal bleed.

Abdominal radiograph (kidneys, ureter, bladder [KUB]) 2%

Abdominal ultrasonography (US) 9%

Computed tomography (CT) ✔ 81%

Correct answer selected

Endoscopic retrograde cholangiopancreatography (ERCP) 2%

Magnetic resonance imaging (MRI) 6%

CT is the modality of choice to assess the severity of acute pancreatitis and the presence of associated complications. More specifically, CT with dynamic intravenous contrast injection can determine the presence and extent of pancreatic necrosis, which remains the primary determinant of length of hospitalization and mortality. Although a KUB can rule out other etiologies for abdominal pain, it does not directly image the pancreas. Imaging by transabdominal US is severely limited by poor transmission of ultrasound waves through bowel gas that normally surrounds the pancreas. MRI is not superior to CT for imaging in acute pancreatitis and is both less available and more expensive. ERCP is contraindicated in acute pancreatitis unless there is evidence of concurrent cholangitis.

A 47-year-old woman presents to the emergency department with several hours' history of nausea and severe pain in the abdomen. She describes her pain as unrelenting mid-epigastric pain radiating to her back.

On examination, the patient is in the fetal position and reluctant to move. She is tachycardic and has a low-grade fever. Orthostatic hypotension is noted. Laboratory study results are remarkable except for an amylase level of 1100 iu/l (<100)

Which of the following tests is most appropriate for assessing the severity of her illness?

- ○ Abdominal radiograph (kidneys, ureter, bladder [KUB])
- ○ Abdominal ultrasonography (US)
- ○ Computed tomography (CT)
- ○ Endoscopic retrograde cholangiopancreatography (ERCP)
- ○ Magnetic resonance imaging (MRI)

Question ID #3584

You are called to see an 82 year old man on the ward who has developed offensive, watery diarrhoea. The man was admitted with chest infection and treated appropriately and, whilst awaiting home assessment and institution of a package of care, has developed diarrhoea associated with some abdominal pain.

He seems comfortable, his temperature is 37.3C, pulse 88 bpm and blood pressure 128/80 mmHg. He has some abdominal tenderness and some increased bowel sounds. His abdominal X-ray is normal and his blood results are normal with a CRP of 12 mg/dl (<5). faecal specimens have been sent and the patient is isolated.

Which of the following is the most appropriate approach to treating this patient?

- ○ No treatment currently required. Await cultures
- ○ Oral co-trimoxazole
- ○ Oral immodium
- ○ Oral metronidazole
- ○ Oral vancomycin

Peer responses

| | | |
|---|---|---|
| No treatment currently required. Await cultures | | 26% |
| ○ | Oral co-trimoxazole | 1% |
| ○ | Oral immodium | 0% |
| Oral metronidazole ✔ Correct answer selected | | 62% |
| | Oral vancomycin | 11% |

This patient is symptomatic with profuse watery diarrhoea, likely from the history to be due to C. Difficile infection. The patient should be treated with oral metronidazole as 1 st line therapy. In more severe cases complicated by systemic illness, oral vancomycin can be used. It is important to remember that supportive care should always be given, including attention to hydration, electrolytes and nutrition. Antiperistaltic agents should be avoided in acute infection due to risk of toxic megacolon. Metronidazole (or vancomycin, if appropriate) can be commenced if patient has diarrhoea AND one of the following: Positive C. difficile toxin test OR Results of C. difficile toxin test pending AND clinical suspicion of C.diff. That means treatment can be commenced if there is strong clinical suspicion while stool results are awaited.

A 74-year-old man with past medical history of coronary artery disease and hypertension presented to emergency care with complaints of fever and abdominal pain 5 hours after a colonoscopic snare polypectomy of a caecal tubulovillous polyp.

He initially tolerated the procedure well, but he noted development of an intermittent, diffuse cramping abdominal pain after returning home, which was relieved by passing flatus. A few hours later, he developed a 9/10 right lower quadrant abdominal pain aggravated by coughing and movement without significant relieving factors. He denies nausea, vomiting, or change in bowel habits.

On examination, the patient had a temperature of 38.1°C but his other observations were normal. On abdominal examination, the patient had normal bowel sounds with diffuse tenderness, most prominent in the right lower quadrant. There was no guarding or rigidity.

Laboratory tests revealed:

| | | |
|---|---|---|
| Haemoglobin | 13.1 | Normal range (130-180 g/l) |
| White cell count | 19.0 | Normal range (4.0-11.0 $x10^9$/L) |
| Mean Cell Volume | 98 | Normal range (80-100 fL) |
| Platelets | 414 | Normal range (150-400 $x10^9$/L) |
| Prothrombin time | 11.2 | Normal range (9.0-13.0 SEC) |
| Lactate | 1.9 | Normal range: 0.5–2.2 mmol/L) |

An abdominal radiograph was read as normal

An abdominal radiograph was read as normal.

A CT of the abdomen and pelvis with contrast revealed significant inflammatory changes within the mesenteric fat surrounding the cecum and thickening of the wall of the cecum.

What is the most likely diagnosis?

- ○ Appendicitis
- ○ Colonic perforation
- ○ Gastroenteritis
- ○ Mesenteric adenitis
- ○ Postpolypectomy electrocoagulation syndrome

A Appendicitis 5%

B Colonic perforation ✖ Incorrect answer selected 36%

C Gastroenteritis 1%

D Mesenteric adenitis 16%

E Postpolypectomy electrocoagulation syndrome ← Correct answer 42%

Postpolypectomy electrocoagulation syndrome, also known as postpolypectomy syndrome, transmural burn syndrome, or microperforation, is a rare but important complication of polypectomy, and is a potential reason for patients to re-present to hospital following a colonoscopy. Patients with postpolypectomy electrocoagulation syndrome typically present within 12 hours following a colonoscopy with fever, tachycardia, and generalized abdominal pain. However, the onset of symptoms may be delayed by up to 5–7 days after the procedure. They are generally managed conservatively with intravenous fluids, pain control, and gradual advancement of diet as tolerated, with or without antibiotics against Gram-negative and anaerobic pathogens.

An 18 year old girl presents to the MAU with her mother. They are quite upset. She has been experiencing diarrhea for the last 5 months, and they are frustrated with lack of action from the GP and have self presented. She has been diagnosed as having Irritable bowel syndrome by her GP, who has sent off 3 different stool samples, all of which are negative. She has not lost weight, and has no other gastrointestinal symptoms.

Investigations reveal:

| | | |
|---|---|---|
| Haemoglobin | 13.1 | Normal range (130-180 g/l) |
| White cell count | 6.0 | Normal range (4.0-11.0 $x10^9$/L) |
| Mean cell volume | 82 | Normal range (80-100 fL) |
| Platelets | 512 | Normal range (150-400 $x10^9$/L) |
| Bilirubin | 45 | Normal range (<21 umol/L) |
| Alkaline phosphatase | 130 | Normal range (30-150 U/L) |
| Alanine transferase | 31 | Normal range (<59 U/L) |
| CRP | 11 | Normal range (<5) |

Which of the following is the most appropriate investigation for this patient?

- ○ Colonoscopy
- ○ Faecal calprotectin
- ○ Faecal MC&S
- ○ Flexible sigmoidoscopy
- ○ Serum elastase

A 50 year old man presents with acute onset ascites. He is known to have Hepatitis C and cirrhosis but is normally well controlled on Spironolactone 50 mg OD, Lactulose 15ml BD and Mirtazapine 15mg OD.

On examination he has mild to moderate ascites.

His blood results show:

| | |
|---|---|
| Sodium | 129 mmol/l (134-144) |
| Potassium | 5.1 mmol/l (3.5-5) |
| Urea | 5.8 mmol/l (3-8) |
| Creatinine | 119 micromol /l (50-110) |

What is the most likely cause of his deranged renal function?

- Acute interstitial nephritis
- Acute tubular necrosis
- Hepatorenal syndrome
- Nephrotic syndrome
- Renal papillary necrosis

Faecal calprotectin ✔ Correct answer selected — 67%

Faecal MC&S — 2%

Flexible sigmoidoscopy — 7%

Serum elastase — 8%

The raised platelet count should raise suspicions of ongoing inflammation. A calprotectin level is a good marker for inflammation in the gastrointestinal tract, and a negative result in the presence of symptoms effectively excludes inflammatory bowel disease, thus avoiding the need for an invasive test in a young patient. This patient does not have signs of acute severe inflammatory bowel disease and therefore doesn't need immediate colonoscopy, although she is likely to require it in the future. 3 negative stool tests is quite convincing for a lack of infection in the stool, and elastase should be measured in the stool, not the serum, for suspected pancreatic insufficiency.

Start N acetyl cysteine 2%

Start ursodeoxycholic acid 5%

Urgent gastroenterology/hepatology review and liaise with obstetric team for early delivery of baby ✔ Correct answer selected 91%

This lady has acute fatty liver disease of pregnancy. It is a life threatening condition, thought to be related to HELLP syndrome. It can be difficult to diagnose as patients often have vague symptoms. The management is prompt delivery of the baby and supportive care to the mother. The Swansea criteria can be used to aid diagnosis and is described below.

Paracetamol levels form part of the liver screen, but the history is not suggestive of overdose. This patient should be kept as an inpatient and not discharged.

N-acetyl cysteine is used in paracetamol overdose, and ursodeoxycholic acid can be used in obstetric cholestasis.

started on oral omeprazole. When should the anti-platelet therapy be restarted?

Peer responses

| | |
|---|---|
| Day 5 ✔ Correct answer selected | 81% |
| Day 30 | 12% |
| Day 90 | 1% |
| Day 180 | 1% |
| Do not re-start antiplatelet agents | 5% |

In patients with UGI bleeding related to antiplatelet therapy induced ulceration it is important to assess the risk benefit of stopping the drugs and increased risk of a coronary event. Studies have shown that these patients are at a high risk of ACS and hence it is recommended that anti-platelet therapy should be recommenced at the earliest opportunity once the acute GI bleeding has settled and the patient is stable.

A 36 year old engineer with Ulcerative colitis presents with rectal bleeding. He is opening his bowels twice a day but not at night, passing blood and mucous. He is also complaining of generalized abdominal pain. His only other medical history is of eczema. This is his first flare of colitis since his initial presentation 3 years ago. His usual medications are Mesalazine 2.4g daily and Diprobase cream.

On examination his abdomen is soft but minimally tender. His blood tests are normal other than a CRP of 44 mg/dl (normal range <5).

His chest and abdominal films are normal, with no evidence of perforation or toxic dilatation.

What is the most appropriate management for this patient?

- ○ Double mesalazine dose to 4.8g
- ○ Reassure and advise to continue mesalazine at current dose
- ○ Start Azathioprine at 50mg daily, then titrate up to target weight based dose after 2 weeks
- ○ Start Intravenous Hydrocortisone
- ○ Start Prednisolone 30mg daily

Peer responses

- Double mesalazine dose to 4.8g — 25%
  ← Correct answer
- Reassure and advise to continue mesalazine at current dose — 8%
- Start Azathioprine at 50mg daily, then titrate up to target weight based dose after 2 weeks — 5%
- Start Intravenous Hydrocortisone — 19%
- Start Prednisolone 30mg daily — 43%
  ✖ Incorrect answer selected

Mild to moderate ulcerative colitis flares can often be managed with increased doses of mesalazine in the first instance. This avoids the need for corticosteroids and their subsequent side effects.

A 54-year-old man presents with haematemesis. He has a history of diabetes mellitus, hypertension and two months ago was diagnosed with acute coronary syndrome. He smokes twenty cigarettes a day up until his admission with ACS but has since stopped.

He undergoes endoscopy which confirmed the presence of a small duodenal ulcer. He was taking aspirin and clopidogrel which were stopped and intravenous omeprazole commenced. On day 4 he was doing well. He had had no further haematemesis. He had a pulse of 68 bpm regular and a blood pressure of 136/80 mmHg. He was started on oral omeprazole. When should the anti-platelet therapy be restarted?

- Day 5
- Day 30
- Day 90
- Day 180
- Do not re-start antiplatelet agents

A 38 year old Asian man is admitted with shortness of breath. He has a background of ulcerative colitis and recently had a moderately severe flare during which he was commenced on 2 weekly infusions of Infliximab. Over the last 48 hours he has become increasingly unwell with cough and fever. His other medication includes Mesalazine 4.8g daily. He has no known allergies He is otherwise fit and well.

His observations are as follows:

HR 105 bpm

BP 108/64 mmHg

RR 23/min

Temp 36.9C

On examination there are bilateral crackles throughout the chest.

His chest radiograph shows widespread small nodular opacities distributed throughout the lung.

What is the best antibiotic(s) to commence in this gentleman?

- ○ Amoxicillin and Clarithromycin
- ○ Co-Trimoxazole
- ○ Doxycycline
- ○ Rifampicin, Isoniazid, Ethambutol and Pyrazinamide
- ○ Tazocin

Peer responses

| | |
|---|---|
| Amoxicillin and Clarithromycin | 4% |
| Co-Trimoxazole | 19% |
| Doxycycline | 0% |
| Rifampicin, Isoniazid, Ethambutol and Pyrazinamide ✔ Correct answer selected | 70% |
| Tazocin | 6% |

This gentleman has miliary TB. Anti-TNF agents can cause relapses of previously dormant or unknown TB, and these often present as miliary TB due to the immunosuppressive effects of infliximab. All patients should be screened for TB vaccination prior to treatment, but sometimes this is missed, especially in emergencies. a such the correct treatment here is for TB.

A 24 year old plumber with Ulcerative colitis presents with severe rectal bleeding. He is opening his bowels over 20 times a day including at least five times at night, passing only blood and mucous. He is also complaining of generalized abdominal pain.

On examination he looks unwell. His observations are:

| | |
|---|---|
| Heart rate | 105 beats per minute |
| Blood pressure | 105/78 mmHg |
| Respiratory rate | 26 breaths per minute |
| Temperature | 36.8 degrees Celsius |

His abdomen is markedly tender in the left iliac fossa but soft.

His blood tests show:

| | | |
|---|---|---|
| Haemoglobin | 9.8 | Normal range (130-180 g/l) |
| White cell count | 13.8 | Normal range (4.0-11.0 $x10^9$/L) |
| Mean cell Volume | 84 | Normal range (80-100 fL) |
| Platelets | 482 | Normal range (150-400 $x10^9$/L) |
| C reactive protein | 98 | Normal range (<3 mg/l) |

Which of the following is the most urgent initial investigation?

- ○ Abdominal CT
- ○ Abdominal x ray
- ○ Faecal Calprotectin
- ○ Stool microscopy culture and sensitivity
- ○ Urgent Flexible sigmoidoscopy

Abdominal CT 15%

Abdominal x ray ✔ Correct answer selected 65%

Faecal Calprotectin 1%

Stool microscopy culture and sensitivity 3%

Urgent Flexible sigmoidoscopy 17%

This gentleman has fulminant/severe ulcerative colitis. The major concern is toxic dilatation of the colon, which can be quickly assessed with an abdominal x ray. These patients may well need an abdominal CT too, but an X ray is the most urgent first line test. Stool microscopy culture and sensitivity should be sent but results will take some time. An urgent flexible sigmoidoscopy is unlikely to change the management during the initial assessment phase as the patient is known to have ulcerative colitis, and the other tests are not useful. Faecal calprotectin is not useful in this scenario.

A 79 year old man with a previous CVA attends A&E. He is percutaneous endoscopic gastrostomy (PEG) fed and his PEG tube has “fallen out” 45 minutes ago after it got caught in his clothing, whilst using the toilet. Unfortunately, the PEG tube fell into the toilet pan but Mr. Jones has brought it with him “incase it can be sterilized”. He is otherwise well:

What is the best management plan?

- Arrange for CCSD to sterilize the old PEG and re insert it
- Arrange for the gastroenterologists to insert a new PEG through a new tract
- Insert a new PEG tube using the kit from endoscopy
- Reassure the patient that the gastroenterology team will be able to use the same tract in the morning and not to put anything down the PEG tract
- Insert a foley catheter into the tract to ensure the tract stays open

gastroenterologists to insert a new PEG through a new tract

Insert a new PEG tube using the kit from endoscopy 7%

Reassure the patient that the gastroenterology team will be able to use the same tract in the morning and not to put anything down the PEG tract 12%

Insert a foley catheter into the tract to ensure the tract stays open ✔ 75%

Correct answer selected

PEG tubes are fitted endoscopically and cannot be re-inserted (especially after toilet exposure!) therefore a new peg kit would not be an option. A balloon gastrostomy is a viable alternative not listed here. A foley catheter prevents the peg tract from closing (which can happen within 4 hours) and allows the safe re-insertion of a balloon gastrostomy the next day. Using the same tract is desirable as it avoids and invasive procedure and the risks of forming a new tract.

A 20 year old female is admitted with nausea and vomiting which commenced after she ate a pizza approximately 4 hours earlier. She felt nauseous had some associated abdominal pain and developed profuse vomiting. She has been unable to keep anything down and has become weaker. She is 29 weeks pregnant with her second child and the pregnancy is doing well. Observations are generally fine, she seems slightly dehydrated yet investigations are normal. She is treated with an IV infusion of normal saline but is distressed by the vomiting.

Which of the following would be the most appropriate approach to managing the nausea and vomiting?

- Continue IV fluids only and no anti-emetics
- IV Dexamethasone
- IV Metoclopramide
- IV Ondansetron
- IV Prochlorperazine

Continue IV fluids only and no anti-emetics

IV Dexamethasone 5%

IV Metoclopramide ← Correct answer 36%

IV Ondansetron ✖ Incorrect answer selected 24%

IV Prochlorperazine 22%

This young woman, who is in her second pregnancy, is likely to have acquired S Aureus food poisoning and is particularly symptomatic as a consequence. The most appropriate approach is to prescribe an antiemetic, and the drug with greatest safety data associated with its use in pregnancy is metoclopramide. Other recommended agents include antihistamines such as cyclizine.

A 71 year old gentleman presents to the acute medical team with fresh rectal bleeding following a bowel screening colonoscopy earlier that day where he said the endoscopist "sorted out my polyps on my rectum". He is still a bit drowsy from his sedation and is passing blood PR.

His observations are:

HR 105 bpm

BP 108/64 mmHg

RR 23/min

Temp 36.9C

What is the most likely cause of his symptoms?

- ○ Bowel prep related rectal bleeding
- ○ Colonic perforation
- ○ Diverticular bleed
- ○ Haemorrhoid irritation post colonoscopy
- ○ Polypectomy bleed

Peer responses

- Bowel prep related rectal bleeding 2%
- Colonic perforation 11%
- Diverticular bleed 7%
- Haemorrhoid irritation post colonoscopy 4%
- Polypectomy bleed ✔ Correct answer selected 76%

Polypectomy bleeding occurs in 1.0-6.1% of all colonoscopic polypectomies and patients are warned that bleeding is a risk. Bowel screening colonoscopies have a high adenoma detection rate and a large number of often large polypectomies are performed; therefore the risk and frequency of bleeding is increased. The team should liaise with the endoscopist, surgical team and interventional radiology.

A 40 year old woman with known alcoholic liver disease presents with jaundice.

Her blood results are as follows:

| | |
|---|---|
| Alkaline phosphatase | 480 iu/l (50-110) |
| AST | 106 iu/l (0-50) |
| Bilirubin | 130 micromol/l (0-20) |
| Prothrombin time | 21s (11-15) |

Her Maddrey's discriminant functions score is 35.

Which of the following is the best treatment to improve her 30 day mortality?

- ○ N Acetyl cysteine
- ○ Pentoxifylline
- ○ Prednisolone
- ○ Prednisolone and pentoxifylline
- ○ Supportive management

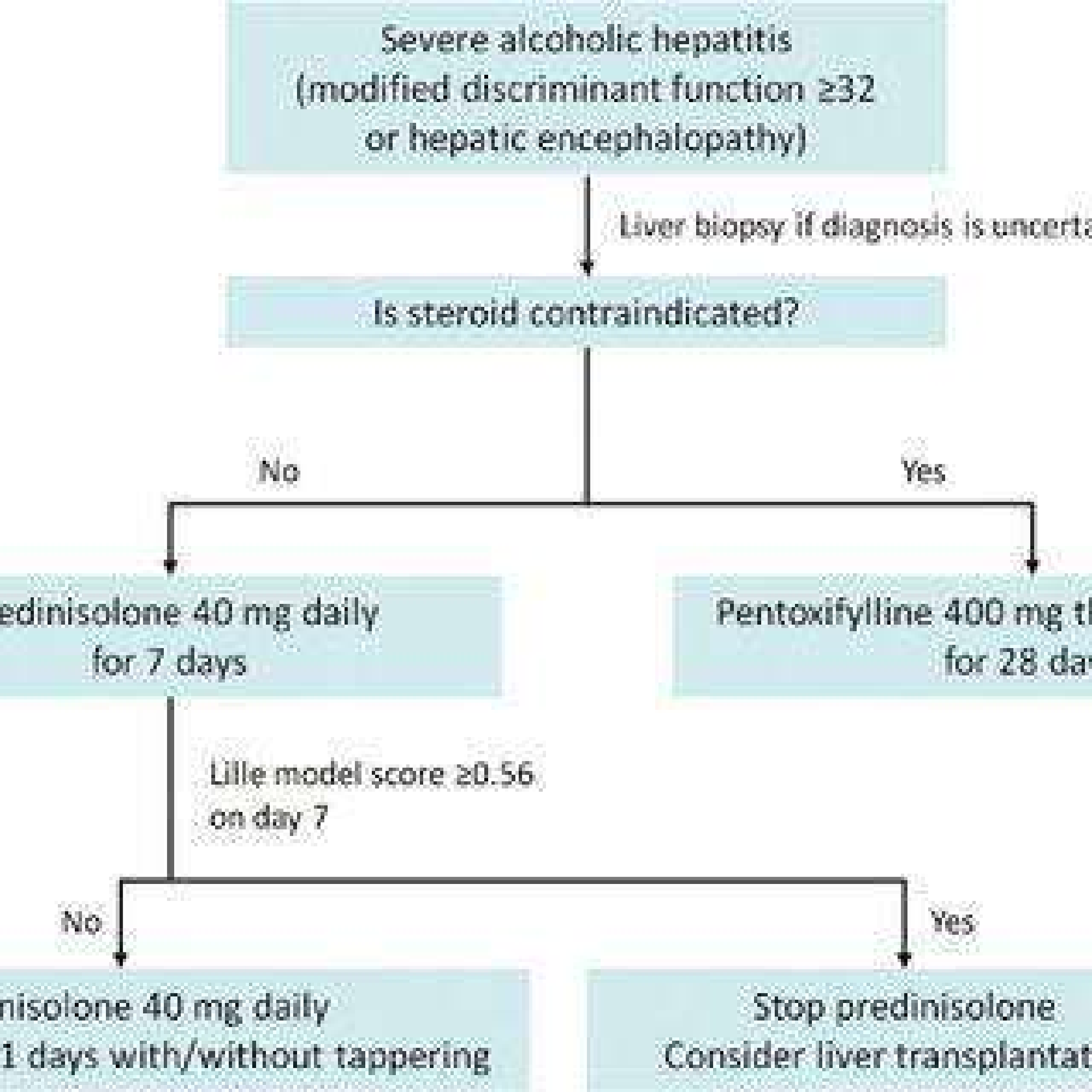
# Discriminant Function (DF)

- Aka **'Maddrey score'**

**DF = (4.6 x increase in PT sec. )) + (serum bilirubin mg/dl)**

- To assess prognosis in alcoholic hepatitis

✓A value over 32 implies severe liver disease with a poor prognosis


Severe alcoholic hepatitis
(modified discriminant function ≥32
or hepatic encephalopathy)
Liver biopsy if diagnosis is uncerta
Is steroid contraindicated?
No
Yes
edinisolone 40 mg daily
for 7 days
Pentoxifylline 400 mg t
for 28 da
Lille model score ≥0.56
on day 7
No
Yes
nisolone 40 mg daily
1 days with/without tappering
Stop predinisolone
Consider liver transplantat

Pentoxifylline 9%

Prednisolone ✔ Correct answer 65%

selected

Prednisolone and pentoxifylline 10%

Supportive management 9%

The recent STOPAH study compared prednisolone and pentoxifylline in a double-blinded randomized controlled trial. Although judged to be underpowered, the study did show an improvement in 28-day mortality with prednisolone, but not with pentoxifylline. The improvements were not seen at 90 days or 1 year. A discriminant function score is useful in predicting short term prognosis with a score above 32 suggesting a poorer prognosis and that the patient may benefit from steroid therapy.

# Maddrey's Discriminant Function for Alcoholic Hepatitis

Suggests which patients with alcoholic hepatitis may have a poor prognosis and benefit from steroid administration.

Favorite ★

Pearls/Pitfalls ^

Maddrey's Discriminant Function is useful in predicting short-term prognosis but is less useful for long-term prognosis.

| | | |
|---|---|---|
| PT | Norm: 11 - 13 | sec |
| PT control/reference level | Norm: 11 - 13 | sec |
| Total bilirubin | Norm: 5.13 - 32.49 | µmol/L ⇋ |

## Result:

**Please fill out required fields.**

# MELD Score (Model For End-Stage Liver Disease) (12 and older)

Stratifies severity of end-stage liver disease, for transplant planning.

Favorite ★

**INSTRUCTIONS**

Use in patients ≥12 years old. Note: As of January 2016, calculation of the MELD has changed. It now includes serum sodium level. See OPTN's announcement.

When to Use ⌄ | Pearls/Pitfalls ⌄ | Why Use ⌄

Dialysis at least twice in the past week
Or CVVHD for ≥24 hours in the past week

No | Yes

Creatinine
Cr >4.0 mg/dL is automatically assigned a value of 4.0

Norm: 62 - 115 | µmol/L ⇋

Bilirubin

Norm: 5.13 - 32.49 | µmol/L ⇋

INR

Norm: 1 - 2

Sodium

Norm: 136 - 145 | mmol/L ⇋

| King's College Hospital Criteria | |
|---|---|
| **Non-PCM** | **PCM** |
| • Any grade HE and INR ≥ 6.5 | • Arterial pH < 7.3 (after adequate fluid resuscitation) |
| OR any three of the following: | OR combination of the following: |
| • INR > 3.5<br>• SBR ≥ 300 µmol/L<br>• Age < 10 or > 40 years<br>• Unfavorable cause (DILI, indeterminate) | • HE ≥ III<br>• Creatinine ≥ 300 µmol/L<br>• INR > 6.5<br>• Lactate > 3.0 |

| Clichy-Villejuif Criteria |
|---|
| Presence of HE<br>AND<br>Factor V level;<br>< 20% of normal in patients < 30 years old<br>OR<br>< 30% of normal in patients > 30 years old |

**Text Box 1**

**The original Kings College Criteria for poor prognosis in Acute Liver Failure.**

**Paracetamol:**
pH<7.3 (irrespective of grade of encephalopathy)
or
Prothrombin time >100 s and serum creatinine >300 μmol/L
In patients with grade III or IV encephalopathy.

**Non-paracetamol:**
Prothrombin time >100 s (irrespective of grade of encephalopathy)
Or
Any 3 of the following variable (irrespective of grade of encephalopathy)
Age <10 or > 40 years
Etiology –non A, non B hepatitis, halothane hepatitis, idiosyncratic drug reactions
Duration of jaundice before onset of encephalopathy >7 days
Prothrombin time >50 s
Serum Bilirubin >300 μmol/L
Source: O'Grady et al.

Current UK ALF Transplant wait listing criterial found at http://odt.nhs.uk/pdf/liver_selection_policy.pdf

A 36-year-old man is evaluated for treatment of hepatitis C. He has not received interferon-based therapy, but is currently taking a complementary alternative medicine (CAM), the name of which he cannot recall. The patient's blood pressure is 156/92 mm Hg, and he has 1+ bilateral lower extremity edema. Laboratory studies are performed, and later that night, the laboratory calls because the serum potassium level is 2.6 mmol/L (3.5-5). The patient takes no other medication and has no history of hypokalemia. You suspect that the patient is taking which of the following?

- Chinese herbal medicine
- Glycyrriza glabra (licorice)
- Silymarin (milk thistle)
- St John's Wort
- Thymic extract

A 48 year old unemployed lady is referred to the medical assessment unit by her general practitioner with a 2 week history of abdominal swelling. She is known to have a history of alcohol abuse and continues to drink around 80 units of alcohol per week. She has no other medical history and lives alone at home.

On examination she is jaundiced and slightly drowsy. She has palmar erythema and multiple spider naevi. She has marked abdominal swelling with shifting dullness, but her abdomen is otherwise soft and non tender.

Her blood results are as follows:

| | | |
|---|---|---|
| Haemoglobin | 12.1 | Normal range (130-180 g/l) |
| White cell count | 6.0 | Normal range (4.0-11.0 $x10^9$/L) |
| Mean Cell Volume | 108 | Normal range (80-100 fL) |
| Platelets | 98 | Normal range (150-400 $x10^9$/L) |
| Bilirubin | 45 | Normal range (<21 umol/L) |
| Alkaline phosphatase | 180 | Normal range (30-150 U/L) |
| Alanine transferase | 280 | Normal range (<59 U/L) |
| Prothrombin time | 20.2 | Normal range (9.0-13.0 SEC) |

What is the most appropriate test to perform next?

- ○ CT abdomen/pelvis
- ○ Fibroscan
- ○ MRCP
- ○ Ultrasound abdomen with portal vein Doppler
- ○ Upper GI endoscopy for varices surveillance

| RIFLE class | AKIN category | Serum creatinine criteria | Urine output criteria |
|---|---|---|---|
| Risk | 1 | An increase of ≥26.4 μmol/l (≥0.3 mg/dl)<br>OR<br>An increase of ≥150–200% (1.5- to 2-fold) from baseline | <0.5 mg/kg/h for at least 6 h |
| Injury | 2 | An increase of ≥200–300% (2- to 3-fold) from baseline | <0.5 mg/kg/h for at least 12 h |
| Failure | 3 | An increase of ≥300% (>3-fold) from baseline<br>OR<br>Serum creatinine ≥354 μmol/l (≥4.0 mg/dl) with an acute rise of at least 44 μmol/l (≥0.5 mg/dl)<br>OR<br>Initiation of RRT | <0.3 mg/kg/h for at least 24 h<br>OR<br>Anuria for >12 h |

A 57 year old teacher presents acutely to the medical assessment unit with a 6 hour history of haematemesis and melaena. He has known osteoarthritis for which he takes regular Naproxen but is otherwise fit and well. He is on no other medication and does not drink alcohol.

On examination he is pale and looks unwell.

**His observations are:**

Heart rate 105 beats per minute

Blood pressure 105/78 mmHg

Respiratory rate 26 breaths per minute

On examination he has marked epigastric tenderness and Maleana on rectal examination.

Which one of the following risk stratification scores is best to use as part of your initial assessment to assess the patient's mortality risk and the urgency and location (inpatient versus outpatient) for endoscopy?

- ○ Discriminant Function
- ○ Forrest Classification
- ○ Glasgow Blatchford score
- ○ Post endoscopy Rockall score
- ○ Pre endoscopy Rockall Score

| | | |
|---|---|---|
| Glycyrriza glabra (licorice) ✔ Correct answer selected | | 66% |
| Silymarin (milk thistle) | | 13% |
| St John's Wort | | 13% |
| Thymic extract | | 2% |

All of these complementary alternative medications have been associated with adverse events. Licorice inhibits 11-ß-hydroxysteroid dehydrogenase, and this may lead to a pseudoaldosterone effect resulting in hypokalemia, sodium retention, and hypertension.

Multiple adverse events have been reported with milk thistle, but the most important relates to its ability to inhibit CYP3A4 and uridine diphospho glucuronosyl transferase. This may lead to interactions with traditional prescription medications such as quinine, lidocaine, certain calcium channel–blocking agents, and cyclosporine, all of which are metabolized in part by CYP3A4.

Chinese herbal medicine has been associated with possible hepatotoxicity, as well as pneumonitis, autoimmune hepatitis, and acute thrombocytopenic purpura.

St John's wort has been shown to cause multiple drug interactions through induction of the cytochrome P450 enzymes CYP3A4 and CYP1A2. This drug-metabolizing enzyme induction results in the increased metabolism of certain drugs, leading to decreased plasma concentration and potential clinical effect

Finally, thymic extract has been reported to cause nausea, vomiting, and, rarely, thrombocytopenia.

| | |
|---|---|
| Forrest Classification | 0% |
| Glasgow Blatchford score ✔ Correct answer selected | 59% |
| Post endoscopy Rockall score | 4% |
| Pre endoscopy Rockall Score | 35% |

The Glasgow Blatchford score is a screening tool used to assess the probability that a patient with a suspected upper GI bleed will need to undergo an intervention such as an endoscopy or blood transfusion. It lacks subjective variables (such as the severity of comorbid disease) or the requirement of upper GI endoscopy pre scoring making it superior to Rockall scoring in the acute environment. In a controlled study 16% of patients with suspected upper GI bleeding had a GBS of 0. There were no deaths or adverse interventions required in these patients and as such these patients can be managed in an outpatient setting.

Rockall scoring is based partly on endoscopic appearances, making it less useful during a patient's acute presentation.

The Forrest Classification is used to grade a bleeding lesion at time of endoscopy to evaluate the risk of re-bleeding.

The Discriminant function is a scoring system used in alcoholic hepatitis to evaluate both the mortality risk and the requirement for treatment with corticosteroids.

A 42 year old lady with chronic liver disease presents unwell to the A&E with diarrhea and vomiting. You are asked to see her due to her history of liver disease. Her diarrhoeal symptoms are settling but you are concerned about acute kidney injury. Her blood tests are as follows:

| | Current results | 2 months ago |
|---|---|---|
| Sodium | 130 mmol/l (134-144) | 137 |
| Potassium | 2.9 mmol/l (3.5-5) | 3.8 |
| Creatinine | 82 micromol/l (50-100) | 61 |
| Urea | 5 mmol/l (3-8) | 2.9 |

At what stage is her acute kidney injury?

- ○ No acute kidney injury as creatinine normal
- ○ Stage 1
- ○ Stage 2
- ○ Stage 3
- ○ Stage 4

| AKI grade | AKI description | Serum creatinine level | Creatinine change | History, physical examination |
|---|---|---|---|---|
| 0 | No AKI | <140 μmol/L (<1.6 mg/dL) | < 26.4 μmol/L (<0.3 mg/dL) | No clinical, laboratory or diagnostic imaging signs of AKI |
| 1 | Nonazotemic AKI | <140 μmol/L (<1.6 mg/dL) | >26.4 μmol/L (>0.3 mg/dL) increase within 48 hour | Any clinical, laboratory or diagnostic imaging sign of AKI, oliguria, or anuria >6 hour |
| 2 | Mild AKI | 141–220 μmol/L (1.7–2.5 mg/dL) | >26.4 μmol/L (>0.3 mg/dL) within 48 hour | Documented AKI, static or progressive azotemia, oliguria, or anuria >6 hour |
| 3 | Moderate | 221–439 μmol/L (2.6–5.0 mg/dL) | | Documented AKI |
| 4 | to severe AKI | 440–880 μmol/L (5.1–10.0 mg/dL) | | |
| 5 | | >880 μmol/L (>10 mg/dL) | | |

AKI, acute kidney injury.

Stage 1 ✔ Correct answer 36%
selected

Stage 2 9%

Stage 3 1%

Stage 4 1%

Patients with chronic liver disease often have a lower creatinine due to decreased synthetic function of the liver. As such, creatinine and urea levels in patients with chronic liver disease should always be compared to previous results in possible, and as such 'normal range' results may represent a significant kidney injury for these patients. In this case there has been over a 1.5 fold increase in creatinine therefore this fits with a stage 1 AKI. There is no stage 4 AKI according to the modified RIFLE criteria.

**Modified RIFLE AKIN criteria**

| Stage | Serum Creatinine (µmol/l) | Urine output (ml/kg/hr) |
|---|---|---|
| 1 | >26.4 µmol/l or >150-200% of baseline | <0.5 for >6hrs |
| 2 | >200-300% of baseline | <0.5 for >12hrs |
| 3 | >300% of baseline or >44 µmol/l from 354 | <0.3 for 24 hrs or Anuria for 12 hrs |

A 56 year old woman presents to the MAU with jaundice. She has noticed increased jaundice over the last week and has recently lost weight. The weight loss has been a deliberate effort as she was previously obese. She feels generally unwell. Her only past medical history is of ulcerative colitis, for which she takes mesalazine.

Her blood results show;

| | | |
|---|---|---|
| Haemoglobin | 12.1 | Normal range (130-180 g/l) |
| White cell count | 4.1 | Normal range (4.0-11.0 x$10^9$/L) |
| Mean cell Volume | 79 | Normal range (80-100 fL) |
| Platelets | 161 | Normal range (150-400 x$10^9$/L) |
| Bilirubin | 145 | Normal range (<21 umol/L) |
| Alkaline phosphatase | 480 | Normal range (30-150 U/L) |
| Alanine transferase | 180 | Normal range (>59 U/L |

You arrange an ultrasound scan of her abdomen. The report shows

"There is dilatation of the common bile duct and intrahepatic biliary ducts. The pancreas is obscured by bowel gas. The liver appears bright but the scan is limited due to body habitus".

What is the next test you should perform?

- ○ CT scan of the abdomen
- ○ Endoscopic retrograde cholangiopancreatoscopy (ERCP)
- ○ Magnetic resonance cholangiopancreatography (MRCP)
- ○ MRI liver
- ○ Serum liver screen including autoimmune antibodies

CT scan of the abdomen 9%

Endoscopic retrograde cholangiopancreatoscopy (ERCP) ✖ 28%

Incorrect answer selected

Magnetic resonance cholangiopancreatography (MRCP) ← 56%

Correct answer

MRI liver 1%

Serum liver screen including autoimmune antibodies 7%

This is a non-invasive test which is excellent for diagnosing the cause of obstructive jaundice. Her history of ulcerative colitis raises the question of possible PSC, which a CT will not rule out effectively. Blood tests should be sent but the MRCP will give you the diagnosis. ERCP should not ideally be used for diagnosis alone and it is an invasive procedure with a 1:50 risk of pancreatitis.

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- Fibroscan 5%
- MRCP 0%
- Ultrasound abdomen with portal vein Doppler ✔ Correct answer selected 84%
- Upper GI endoscopy for varices surveillance 3%

This patient clearly has decompensated alcoholic liver disease with ascites. Their initial management should include stabilisation, prevention of acute inpatient alcohol withdrawal and investigation of potential causes of deterioration. These causes include but are not limited to Infection such as spontaneous bacterial peritonitis (SBP), Alcoholic hepatitis, Gastrointestinal bleeding and Portal vein thrombosis. In this scenario, and ultrasound is the only listed option that would form part of your management plan (along with other tests)

A diagnostic tap is not contraindicated with high prothrombin time. It is a vital part of the initial workup and with correct technique is safe even in patients with a high prothrombin time. Diazepam is a benzodiazepine commonly prescribed for alcohol withdrawal. The risks of seizure in these patients are high and regimens such as the Clinical Institute Withdrawal Assessment for Alcohol (CIWA) should be used routinely

Serum ammonia level can be used to assess the presence of encephalopathy, but is not an accurate tool and cannot evaluate the severity of encephalopathy

In alcoholic liver disease the ALT rarely rises above 400, and is not a marker of severity of disease. Clotting screens are more useful in this regard as they represent the synthetic function of the liver.

Next Exit

A 64 year old man with known alcohol abuse presents to A&E. He has had frank haematemesis for the last 4 hours. On presentation his observations are

HR 130 bpm

BP 89/64 mmHg

RR 28/min,/p>

Temp 36.9C

You secure intravenous access, and send bloods for analysis. While you await blood results you give him intravenous fluids plus 2mg terlipressin.

His blood results show;

| | | |
|---|---|---|
| Haemoglobin | 8.1 | Normal range (130-180 g/l) |
| White cell count | 6.0 | Normal range (4.0-11.0 $x10^9$/L) |
| Mean Cell Volume | 108 | Normal range (80-100 fL) |
| Platelets | 59 | Normal range (150-400 $x10^9$/L) |

Despite your initial management there is no improvement and he continues to have large volume haematemesis. You contact the gastroenterologist at home but there is no on call GI bleeding rota, and he is away from home therefore it will be some time before he can perform an endoscopy.

What is the next best management option?

- ○ Insert sengstaken tube and inflate esophageal balloon
- ○ Insert sengstaken tube and inflate gastric balloon
- ○ Insert sengstaken tube and insert both gastric and esophageal balloons
- ○ Intravenous proton pump inhibitor
- ○ Repeat terlipressin 2mg IV

A 68 year old man was admitted with haematemesis. He had gone out the evening before and had drunk too much alcohol at a wedding party. He vomited in the early hours and then on the last couple of occasions vomited frank blood. He vomited blood on two occasions, the last of which was 2 hours ago. His wife brought the pillow cloth on which he vomited, which shows dark blood staining. He had nothing of note in his past medical history other than type 2 diabetes and hypertension, for which he takes metformin, ramipril, simvastatin and clopidogrel.

On examination, he was subdued with a pulse of 68 bpm and a blood pressure of 116/60 mmHg. His haemoglobin concentration was 116 mg/l (120-160). Coagulation and LFTs were normal. His urea is normal at 4 mmol/l and creatinine is also reported normal As part of the management plan, clopidogrel was stopped. The admitting doctor calculates his Blatchford score to be 3.

Which of the following is the most appropriate approach to the management of this patient?

- ○ Admit and arrange immediate endoscopy
- ○ Admit and arrange endoscopy within 24 hrs
- ○ Admit and monitor without necessarily arranging endoscopy unless clinical condition deteriorates
- ○ Commence oral PPI, discharge if clinical observations stable over view to outpatient endoscopy (within 1 week)
- ○ Discharge in about 4 hours if no further haematemesis has occurred and observations stable with no requirement for future endoscopy

Insert sengstaken tube and inflate gastric balloon ← Correct answer 24%

Insert sengstaken tube and insert both gastric and esophageal balloons 36%

Intravenous proton pump inhibitor 6%

Repeat terlipressin 2mg IV 8%

PPI and terlipressin is unlikely to rescue this gentleman and he needs endoscopic therapy. If this is unavailable a sengstaken tube is an effective way to manage variceal bleeding. Only the gastric balloon should be used as gastric varices fill from the stomach upwards, and the oesophageal balloon can cause significant mucosal necrosis and further bleeding.

Admit and arrange endoscopy within 24 hrs ✔ Correct answer selected — 52%

Admit and monitor without necessarily arranging endoscopy unless clinical condition deteriorates — 17%

Commence oral PPI, discharge if clinical observations stable over view to outpatient endoscopy (within 1 week) — 15%

Discharge in about 4 hours if no further haematemesis has occurred and observations stable with no requirement for future endoscopy — 8%

In this man's case, he has had a witnessed haematemesis and he is over 60 giving a Rockall score of 1. His Blatchford score is 3 thus putting him in a high risk category. NICE recommends calculating Blatchford score for all patients admitted with UGI bleed pre-endoscopy and early discharge should only be considered for patients with a pre-endoscopy Blatchford score of 0.

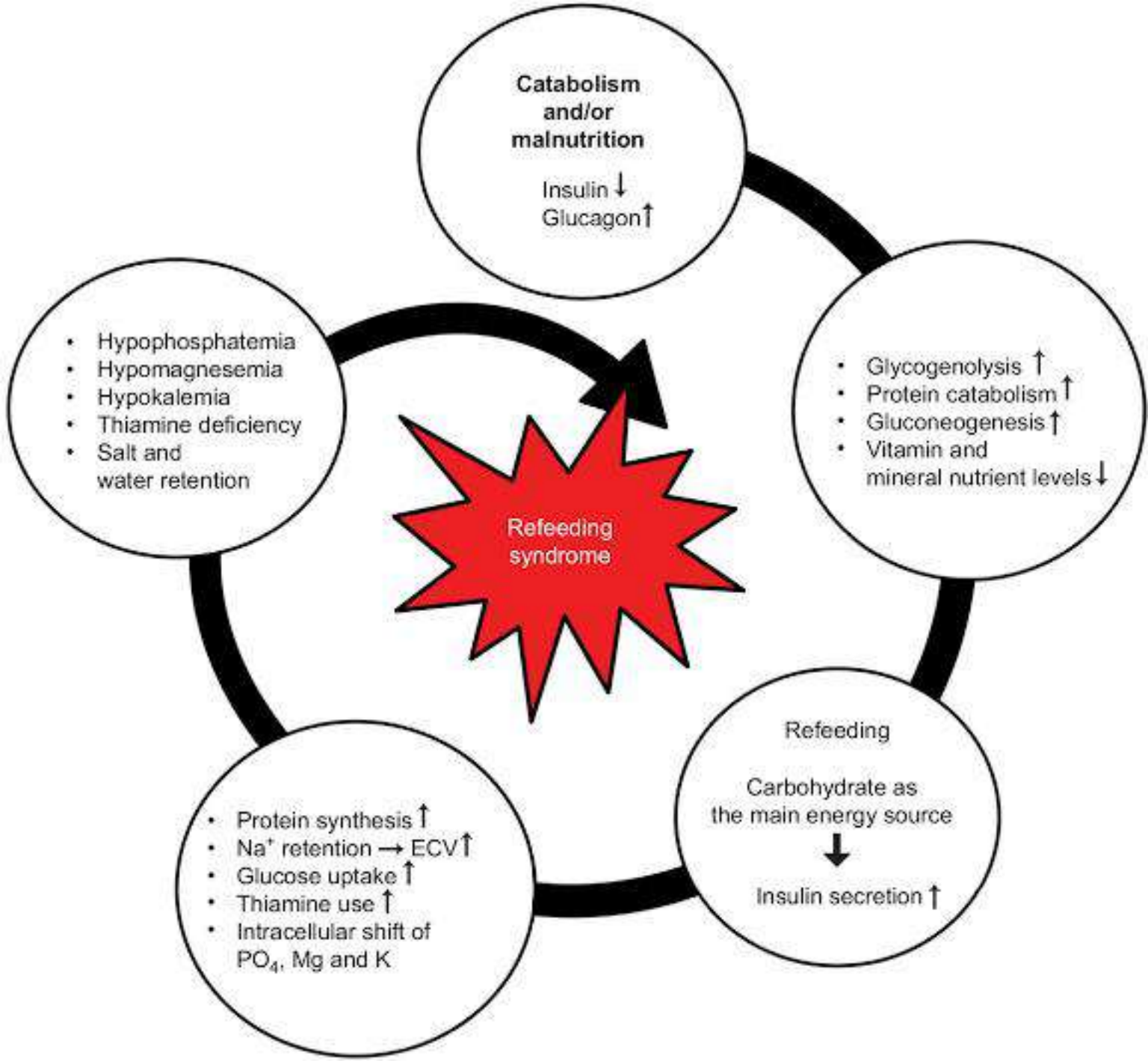
The most likely diagnosis here is a Mallory-Weiss tear from the description but even so, the guidelines suggest that this man should be admitted and, where possible have an endoscopy performed within 24 hrs. According to NICE one should offer endoscopy to unstable patients with severe acute upper gastrointestinal bleeding immediately after resuscitation and within 24 hours of admission to all other patients with upper gastrointestinal bleeding. There is no evidence that commencing a PPI before endoscopy would have any prognostic benefit.

NICE Clinical guideline CG141. 2012. Acute upper gastrointestinal bleeding in over 16s: management

An 18-year-old dancer with a 10-year history of anorexia nervosa presents to the emergency department with confusion, headache, and diffuse weakness one day after a performance. The patient severely restricts her daily intake, keeping to a low-calorie diet for one week before each performance. Immediately after each performance, she quickly liberalizes her diet and starts eating a lot more calories in the form of carbohydrates. Her height is 1.56m and she weighs 47kg. The emergency department staff suspects refeeding syndrome.

Which laboratory result is most commonly seen with refeeding syndrome?

- Hypercalcemia
- Hypermagnesemia
- Hyperphosphatemia
- Hypocalcemia
- Hypophosphatemia


Catabolism and/or malnutrition
Insulin ↓
Glucagon ↑
Glycogenolysis ↑
Protein catabolism ↑
Gluconeogenesis ↑
Vitamin and mineral nutrient levels ↓
Refeeding
Carbohydrate as the main energy source
Insulin secretion ↑
Protein synthesis ↑
Na+ retention → ECV ↑
Glucose uptake ↑
Thiamine use ↑
Intracellular shift of PO4, Mg and K
Hypophosphatemia
Hypomagnesemia
Hypokalemia
Thiamine deficiency
Salt and water retention
Refeeding syndrome

Question ID #3962

A 37-year-old man with AIDS whose last CD4 count was 58 presents to the MAU with a four-day history of diarrhoea. He has not been taking his highly active antiretroviral therapy (HAART) medications regularly. The diarrhoea is of large volume, non-bloody, and he has associated nausea, but does not complain of abdominal pain.

What is the most likely cause of the patient's diarrhea?

- ○ Campylobacter species
- ○ Escherichia coli
- ○ Microsporidium
- ○ Salmonella
- ○ Shigella

| | | |
|---|---|---|
| | Campylobacter species | 13% |
| | Escherichia coli | 6% |
| | Microsporidium ✔ Correct answer selected | 79% |
| | Salmonella | 1% |
| | Shigella | 1% |

Microsporidium is one of the most common intestinal infections in patients with AIDS. Intestinal and hepatobiliary disease may be caused by two species: Enterocytozoon bieneusi and Encephalitozoon intestinalis. Typical symptoms are watery, nonbloody diarrhea of mild to moderate severity, but without associated crampy abdominal pain. Weight loss is common. Infection is associated with severe immunodeficiency with CD4 counts less than 100/L

An elderly man with advanced Alzheimer's Dementia (bed bound, uncommunicative, very limited understanding, doubly incontinent and on a thickened diet) was admitted by ambulance to A&E from his nursing home on account of haematemesis. He had 2 episodes: one in the nursing home and a second witnessed by the paramedics. The volume was estimated to have been about 20ml/episode. His usual medication included aspirin.

On examination, he appeared comfortable, with no apparent epigastric tenderness; his observations were normal (respiratory rate 18, saturations 97% on air, blood pressure 140/90, pulse 88bpm). His pads were wet and there was no melaena on rectal examination.

His bloods returned revealing a haemoglobin 140 g/l (120-160), white cell count 7x109/l (3-10), platelet 200x109/l (200-400), U&E, lactate and coagulation screen were normal.

His condition was discussed with his family and they agreed with the clinician that resuscitation in the event of cardiopulmonary arrest was not in his best interests.

He remained well in the department and his bloods were repeated 6 hours later with a haemoglobin of 13 g/l.

Which of the following would you advocate is the most appropriate plan here aside stopping his aspirin and starting proton pump inhibitors?

- ○ Admit and refer to surgeons for review
- ○ Admit for an inpatient endoscopy
- ○ Admit overnight for observation and repeat FBC tomorrow and manage according to that result
- ○ Discharge and arrange outpatient endoscopy
- ○ Discharge with advice for his GP to review him should there be further concerns

Admit for an inpatient endoscopy 16%

Admit overnight for observation and repeat FBC tomorrow and manage according to that result ✖ Incorrect answer selected 39%

Discharge and arrange outpatient endoscopy 12%

Discharge with advice for his GP to review him should there be further concerns ← Correct answer 32%

As this gentleman has end stage Alzheimer's and his management is primarily about symptom support and tender loving care, further investigation is not required and a palliative management plan should be developed. A cause is apparent in relation to his aspirin therapy and his results do not suggest substantial blood loss based on the normal urea, wet pads (suggesting uncompromised urine output) and a repeat Hb that is reassuring.

A 26-year-old woman presents to the MAU with a 4 day history of diarrhoea. She is opening her bowels 8 times a day, passing type 7 stools. There is no blood in the stool. Her symptoms started following a barbeque at a friend's house. She is clinically dehydrated and is resuscitated with intravenous fluids.

After 48 hours her symptoms have settled, but the stool sample sent on admission has cultured Campylobacter spp.

What is the next correct management step?

- ○ Inform public health, as Campylobacter spp is a notifiable disease
- ○ Keep in hospital until stool culture is negative
- ○ Screen other attendees at the barbeque for potential campylobacter infection
- ○ Treat with oral ciprofloxacin
- ○ Treat with oral metronidazole

- [x] Inform public health, as Campylobacter spp is a notifiable disease — 63%

Correct answer selected

- [ ] Keep in hospital until stool culture is negative — 0%
- [ ] Screen other attendees at the barbeque for potential campylobacter infection — 4%
- [ ] Treat with oral ciprofloxacin — 30%
- [ ] Treat with oral metronidazole — 3%

Campylobacter infection is a notifiable disease closely linked to eating undercooked chicken. Antibiotics can be used if diarrhoeal symptoms persist but are not required if symptoms have settled. There is no need to screen other attendees.

Question ID #3964

A 36-year-old man presents to the emergency department with several hours' history of nausea and severe pain in the abdomen. He describes epigastric pain radiating to his back.

On examination, the patient is in the fetal position and reluctant to move. He is tachycardic and has a low-grade fever.

The admission laboratory tests included:

| | | |
|---|---|---|
| Haemoglobin | 150 | Normal range (130-180 g/l) |
| White cell count | 22.0 | Normal range (4.0-11.0 x$10^9$/L) |
| Bilirubin | 32 | Normal range (<21 umol/L) |
| AST | 130 | Normal range (<40U/L) |
| ALT | 170 | Normal range (<59 U/L) |

In this patient, which of the following laboratory studies is most indicative of severe disease?

- ○ Alkaline phosphatase
- ○ Amylase
- ○ AST level
- ○ Bilirubin
- ○ WBC count

| Ranson (alcoholic or other) | Ranson (biliary) |
|---|---|
| **At admission** | **At admission** |
| Age >55 y | Age >70 y |
| GB > 16 000/$mm^3$ | GB > 18 000/$mm^3$ |
| LDH > 350 U/l | LDH > 250 U/l |
| AST > 250 U/l | AST > 250 U/l |
| Glycemia >200 mg/dl | Glycemia >220 mg/dl |
| **In 48 h** | **In 48 h** |
| Drop in hematocrit > 10% | Drop in hematocrit > 10% |
| BUN increase >5 mg/dl | BUN increase >2 mg/dl |
| Calcium <8 mg/dl | Calcium <8 mg/dl |
| $PO^2$ <60 mmHg | $PO^2$ <60 mmHg |
| Bases deficit >4 mEq/l | Bases deficit >5 mEq/l |
| Fluid loss >6L | Fluid loss >4L |
| Each item worth 1 point (0 a 11 points) | |

| | | |
|---|---|---|
| | Bilirubin | 13% |
| WBC count ✔ selected | Correct answer | 47% |

In acute pancreatitis, the Ranson criteria have been time-tested indicators of disease severity and prognosis. Ranson criteria include five admission criteria: (1) age older than 55, (2) WBC count greater than 16,000, (3) glucose level greater than 200 mg/dl (11.1 mmol/l), (4) lactate dehydrogenase level greater than 350 u/l, (5) AST level greater than 250, and five criteria determined at 48 hours: (1) hematocrit decrease more than 10, (2) BUN increase more than 5, (3) calcium less than 8, (4) PO2 less than 60, (5) base deficit more than 4. Amylase and lipase levels are not good predictors of disease severity or prognosis.

A 64 year old gentleman presents with gross ascites. He has a background of cirrhosis due to hepatitis C from a previous blood transfusion in 1978. As part of his workup you perform a diagnostic ascitic tap to rule out spontaneous bacterial peritonitis

Which of the following is diagnostic of spontaneous bacterial peritonitis on ascitic fluid analysis?

- Lymphocyte count >250 cells/mm3
- Neutrophil count >150 cells/mm3
- Neutrophil count >250 cells/mm3
- White cell count >150 cells/mm3
- White cell count >250 cells/mm3

Lymphocyte count >250 cells/mm3 0%

Neutrophil count >150 cells/mm3 1%

Neutrophil count >250 cells/mm3 ✔ Correct answer selected 73%

White cell count >150 cells/mm3 1%

White cell count >250 cells/mm3 25%

The other results are not diagnostic of SBP

It is important to effectively diagnoses and treat SBP as the consequences can be life threatening. The current UK guidelines suggest a diagnostic level of 250 neutrophils/mm3 as the cut off for SBP. If infection is confirmed, Broad spectrum antibiotics should be commenced, and albumin infusions are also often given.

A 17-year-old otherwise healthy girl notes that her urine has become darker than usual and she is having a difficult time concentrating in school. Routine blood tests show the following results.

| | |
|---|---|
| Haemoglobin level | 80 g/L (110-160) |
| Bilirubin | 9 micromol/l (<18) |
| Alkaline Phosphatase | 90 iu/l (50-110) |
| AST | 700 iu/l (10-50) |
| ALT | 890 iu/l (10-50) |

Hepatitis A/B/C serology results are negative.

Which is the most likely diagnosis?

- ○ Alcoholic hepatitis
- ○ Autoimmune hepatitis (AIH)
- ○ IgG related disease
- ○ Ischemic hepatitis
- ○ Wilson's disease

IgG related disease 7%

Ischemic hepatitis 2%

Wilson's disease ✔ Correct 52%

answer selected

Wilson's disease is most commonly diagnosed in children and young adults and should be suspected in this age group. This disorder results from a defect in the ATP7A gene and results in copper retention in the liver resulting in hepatocyte injury. Patients can present in various ways, from asymptomatic abnormalities in blood work to fulminant hepatic failure. Patients presenting with severe acute Wilson's disease are often noted to have hemolysis with an elevated hyperbilirubinemia and anemia resulting in jaundice. AST and ALT levels are often quite elevated compared with the alkaline phosphatase, which is either normal or below normal in acute settings. Patients presenting in this manner need to be diagnosed expeditiously and transferred to a liver transplantation facility as copper chelators are not beneficial in this setting.

A 78-year-old lady presents to the MAU with atrial fibrillation with a fast ventricular rate. Her medical history includes hypertension, for which she takes Ramipril 2.5mg. You commence her on a Beta-blocker for rate control, and discuss the option of commencing anticoagulant therapy for stroke prevention. She is concerned about the risk of bleeding.

Which of the following scoring systems could you use to help evaluate this patient's risk of major haemorrhage

- ○ CHADS VASC SCORE
- ○ CHADS VASC 2 SCORE
- ○ GLASGOW BLATCHFORD SCORE
- ○ HASBLED SCORE
- ○ ROCKALL SCORE

GLASGOW BLATCHFORD SCORE 0%

HASBLED SCORE ✔ Correct answer selected 85%

ROCKALL SCORE 5%

The HASBLED score will calculate the risk of major haemorrhage in 1 year in patients with atrial fibrillation. CHADS VASC and CHADS VASC 2 are used to evaluate risk of thrombotic stroke in atrial fibrillation. GBS and Rockall scores are used in GI bleeding.

| | Condition | Points |
|---|---|---|
| H | Hypertension: (uncontrolled, >160 mmHg systolic) | 1 |
| A | Abnormal renal function: Dialysis, transplant, Cr >2.26 mg/dL or >200 µmol/L Abnormal liver function: Cirrhosis or Bilirubin >2x Normal or AST/ALT/AP >3x Normal | 1 |
| S | Stroke: Prior history of stroke | 1 |
| B | Bleeding: Prior Major Bleeding or Predisposition to Bleeding | 1 |
| L | Labile INR: (Unstable/high INRs), Time in Therapeutic Range <60% | 1 |
| E | Elderly: Age > 65 years | 1 |
| B | Prior Alcohol or Drug Usage History (> 8 drinks/week) Medication Usage Predisposing to Bleeding: (Antiplatelet agents, | 1 |

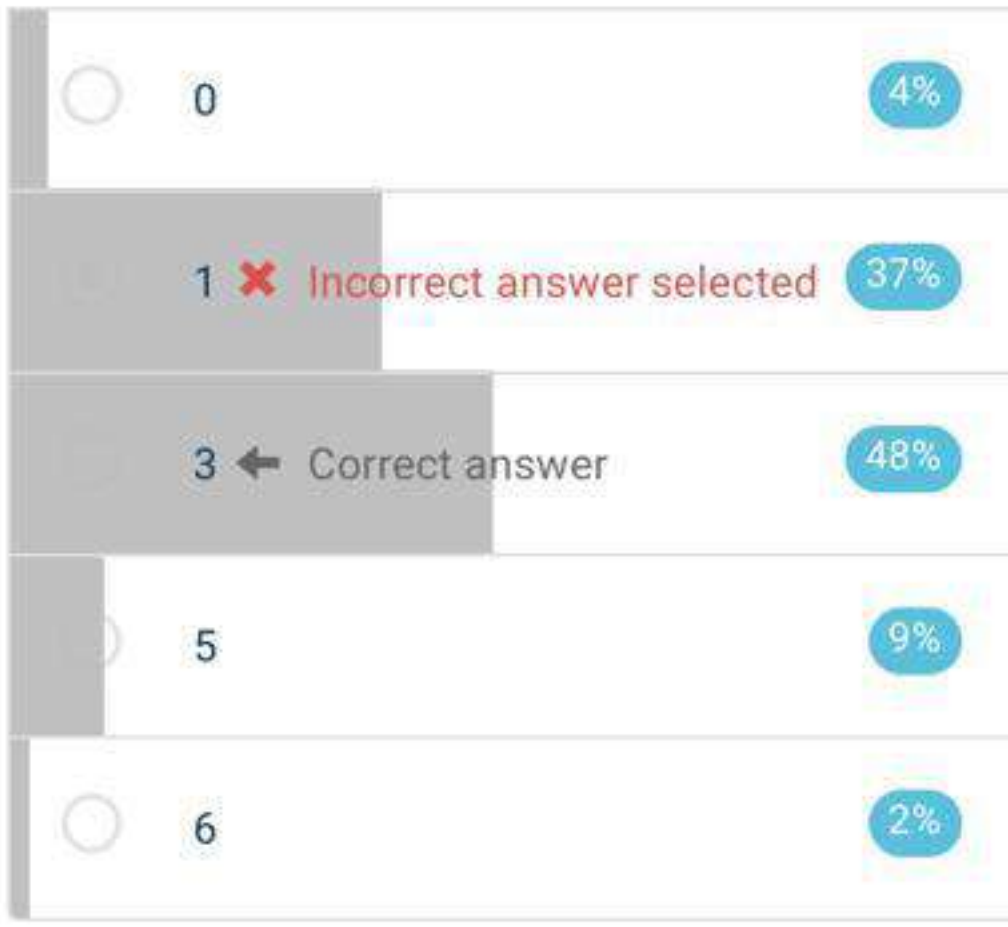
A 58 year old man was admitted with haematemesis. Over the last 2 days he had suffered from abdominal discomfort and anorexia. Today, he developed vomiting of dark blood. He had nothing of note in his past medical history other than type 2 diabetes treated with metformin. He also took simvastatin as a prescribed medication and aspirin 75mg daily. On examination, he was pale with a pulse of 110 bpm and a blood pressure of 106/60 mmHg.

Which of the following is this patient's initial Rockall score?

- 0
- 1
- 3
- 5
- 6

| Variables | Responses | Scores |
|---|---|---|
| **Age (in years)** | < 60 | 0 |
| | 60-79 | 1 |
| | >80 | 2 |
| **Shock** | No shock | 0 |
| | Tachycardia (SBP > 100 mmHg, Pulse > 100 beats/minute) | 1 |
| | Hypotension (SBP < 100 mmHg, Pulse > 100 beats/minute) | 2 |
| **Co-morbidity** | None | 0 |
| | Cardiac failure, IHD, any major co-morbidity | 2 |
| | Renal/liver failure, metastatic malignancy | 3 |
| **Diagnosis (post-endoscopy)** | Mallory-Weiss tears | 0 |
| | All other diagnoses | 1 |
| | Malignancy of the upper GI tract | 2 |

Peer responses




In acute GI haemorrhage, the Rockall score has predictive significance. A simple way of remembering the Rockall Score is ABCDE. ABC gives you the initial score. A = age (below 60 scores 0, 60-79 = 1 and 80 and above =2); B = blood pressure (tachycardia above 100 =1 or BP below 100 = 2); C = co-morbidity (major co-morbidity such as IHD =2, renal/liver disease or Ca =3. Then, the following criteria would be after endoscopic evaluation. D = Diagnosis (Mallory Weiss = 0, all other diagnoses=1, malignancy = 2). E = evidence of haemorrhage – blood adherent clot =1). In our case with age less than 60 (0), pulse above 100 (1) but blood pressure above 100 (0), this patient has an initial Rockall score of 1 suggesting a mortality of 2.4%.

In view of his story and the development of melaena, this suggests a large GI bleed probably a consequence of peptic ulceration related to NSAIDs.

A 76 year old man undergoes an upper GI endoscopy for dyspepsia. The findings are unremarkable and he is discharged home. However, he attends A&E 3hrs later that evening with a 1 hour history of acute, severe central chest pain associated with feeling hot and sweaty.

On examination, he appears in pain with a pulse of 98 bpm, a blood pressure of 148/88 mmHg and a temperature of 38.3C.

Which is the most appropriate investigation from the following list to confirm this gentleman's diagnosis?

- ○ Barium swallow
- ○ CXR
- ○ ECG
- ○ Gastrografin swallow
- ○ Troponin

Peer responses

| | |
|---|---|
| Barium swallow | 6% |
| CXR ✖ Incorrect answer selected | 50% |
| ECG | 14% |
| Gastrograffin swallow ← Correct answer | 26% |
| Troponin | 4% |

The likely diagnosis here is iatrogenic oesophageal perforation. Although very rare in diagnostic OGD, it can occur and the fever here suggests that this is unlikely to be cardiac in origin, and as such the most likely test to confirm the diagnosis is a contrast swallow. Gastrografin should be used as it is water soluble and will not cause mediastinitis, unlike barium. Ideally, a plain film swallow should be performed prior to CT as the radiation dose is less.

StudyPRN

# Acute Medicine SCE Revision Infectious diseases

| | | |
|---|---|---|
| PT | 12 seconds | 12-14 seconds |
| APTT | 34 seconds | 30-46 seconds |
| S/Creatinine | 234 micromol/l | 50-120 umol/l |
| S/Urea | 66 mmol/l | 2.5-6.7 mmol/l |
| ALT | 47 iu/l | 5-40 iu/l |
| LDH | 365 iu/l | <300iu/l |
| CXR (PA View) | Bilateral Hilar & Lower Zone Non-Homogenous Opacities | |

What is the most likely diagnosis?

- ○ Aspergillosis
- ○ Community acquired pneumonia
- ○ Pneumocystis jiroveci pneumonia
- ○ Pulmonary tuberculosis
- ○ Sarcoidosis

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A 37 year old lady who had a cadaveric renal transplant 5 months ago presents to Accident and Emergency with complaints of fever, dry cough and worsening of shortness of breath over the last 4 days. She is known to have Alport's syndrome and has remained on peritoneal dialysis for 1 year. Her current medications include oral prednisolone, mycophenolate mofetil, tacrolimus, lisinopril and omeprazole.

On examination, she appears short of breath with a respiratory rate of 26/min and an oxygen saturation of 90% on 2 liters of oxygen. Her blood pressure is 140/90 mmHg with a temperature of 38°C. There is no pallor or pedal edema. Her chest auscultation reveals bilateral pan inspiratory coarse crackles. The rest of the examination is unremarkable.

Her investigations reveal:

| | | |
|---|---|---|
| Hb | 12.3 g/dl | 13-18 g/dl |
| WBC | 13.6 x $10^9$/l | 4-11 x $10^9$/l |
| Platelets | 133 x $10^9$/l | 150-300 x $10^9$/l |

Aspergillosis 12%

Community acquired pneumonia 4%

Pneumocystis jiroveci pneumonia ✔ Correct answer selected 77%

Pulmonary tuberculosis 6%

Sarcoidosis 1%

This patient with renal transplantation has now become acutely unwell with fever and chest infection. The timing of an infectious episode after transplantation is crucial in establishing a diagnosis. In the first one month after transplantation, usually infections related to the surgery itself or indwelling catheters like urinary tract infections are common. Whereas the most common time for opportunistic infections to occur secondary to immunosuppression is the 1-6 month period post-transplant, as encountered with this patient. Pneumocystis jiroveci pneumonia (PCP) is an opportunistic chest infection with the patient presenting with nonspecific pneumonic symptoms like cough (often dry), fever, shortness of breath and occasionally hemoptysis. 2 main differentiating points between PCP and community acquired pneumonia remain the chest X ray findings and an elevated LDH in case of PCP. The chest X ray although normal in mild disease usually yields peri-hilar bilateral middle-lower zone infiltrates in PCP. Bronchoalveolar lavage remains the mainstay diagnostic modality with co-trimoxazole being the first line treatment.

You are asked to see a 75 year old man who has been treated for congestive heart failure. The nurses are concerned that he has developed site infection of his peripheral venous line. On examination, he has a red and angry looking venflon site in his right forearm. It is tender to touch with a 3 cm area of redness and swelling around the venflon site. He is apyrexial. You remove the catheter and send this for culture.

Which of the following is the most appropriate approach to the management of the patient?

- IV flucloxacillin
- IV vacomycin
- No further treatment required
- Oral doxycycline
- Oral flucloxacillin

| | | |
|---|---|---|
| | IV flucloxacillin | 17% |
| | IV vacomycin | 8% |
| | No further treatment required | 23% |
| | Oral doxycycline | 2% |
| | Oral flucloxacillin ✔ Correct answer selected | 50% |

This patient has developed a line site infection that does not seem severe and is associated with tenderness and redness over the cannula. The cannula needs to be removed and the likely source of infection is S Aureus, Therefore, the use of oral flucloxacillin as first line choice for this uncomplicated infection would be appropriate, which is active against most Staph Aureus, pending cultures.

Further References

You are asked to see a 72 year old man on the urology ward who has developed a polyarthritis affecting his right knee, ankles, and wrists. He had his 3rd treatment with intravesical BCG chemotherapy for a transitional cell carcinoma of the bladder 5 days earlier.

On examination, his temperature is 38.1°C, he has a warm effusion at his right knee with movement limited to 40 degrees of flexion, he is unable to fully extend His ankles and wrists are tender but not swollen and movement is normal. He has no lymphadenopathy and the rest of his examination is unremarkable.

Investigations reveal:

| | | |
|---|---|---|
| **Hb** | 11.2 g/dl | (13.5-17.7g/dl) |
| **WBC** | 14.1 $x10^9$/l | (4-11 $x10^9$/l) |
| **Neutrophils** | 8.4 $x10^9$/l | (2.0-7.5 $x10^9$/l) |
| **Lymphoctytes** | 5.2 $x10^9$/l | (1.5-4.0 $x10^9$/l) |
| **Platelets** | 440 $x10^9$/l | (150-400 $x10^9$/l) |
| **ESR** | 90 mm/hr | (0-10 mm/hr) |
| **CRP** | 158 mg/dl | (<5 mg/dl) |
| **Creatinine** | 132?mol/l | (79-110?mol/l) |
| **Urea** | 7.5 mmol/l | (2.5-6.7 mmol/l) |
| **ALT** | 26 u/l | (5-40 u/l) |
| **ALP** | 134 u/l | (39-117 u/l) |

Which of the following investigations would you initially request?

- ○ Aspirate joint and send for AFB
- ○ Aspirate joint and send for crystal analysis
- ○ Aspirate joint and send for gram-stain, microscopy and culture
- ○ Chest x-ray
- ○ Mantoux test

Aspirate joint and send for AFB 14%

✖ Incorrect answer selected

Aspirate joint and send for crystal analysis 15%

Aspirate joint and send for gram-stain, microscopy and culture 66% ← Correct answer

Chest x-ray 4%

Mantoux test 1%

Treatment by instillation of an attenuated mycobacterium bovis into the bladder is common in superficial transitional cell bladder cancers. Following this a non-infectious polyarthritis may occur in 0.5-1% of patients. Knees are most commonly affected followed by ankles and wrists. Oligo and monoarthritis can also occur. Rarely sacroilitis, dactylitis, conjunctivitis, and uveitis can occur. Joint aspirates do not grow mycobacterium. The exact mechanism is unclear but it is thought that it is a T-cell mediated immune response to repeated antigen stimulation. It tends to occur after several instillations (mean 5). Pyrexia occurs in 2/3 of patients and most will mount raised inflammatory markers. Most are NSAID responsive but if there is no improvement rifampicin and isoniazid treatment may be effective. Infectious arthritis occurs much less frequently. A recent review found 8 cases, 1 had a monoarthritis of the knee; 2 had infection of a joint prosthesis, knee, and hip, respectively; and 5 had discitis. Infection of other organs (lungs, liver, and urinary tract) is more common. Joint infection tends to present and be diagnosed later than non-infectious cases, 8 months vs. 9 days on average. Patients also tend

A 42-year-old woman presents with a three-week history of progressive fatigue, right upper quadrant discomfort, nausea, and jaundice. Her serum ALT level is 10 times the upper limit of normal. The presence of which of the following in a blood sample is most indicative of acute Hepatitis B virus (HBV) infection?

- Anti-HBc IgA
- Anti-HBc IgG
- Anti-HBc IgM
- Anti-HBs
- HBsAg

Anti-HBc IgM ✔ Correct answer selected 58%

Anti-HBs 7%

HBsAg 31%

The incubation period of HBV infection ranges from 60 to 180 days. The clinical presentation varies, from asymptomatic infection to cholestatic hepatitis with jaundice and, rarely, liver failure.

In patients with acute infection, HBsAg and markers of active viral replication (HBeAg and HBV DNA) become detectable approximately six weeks after inoculation, before the onset of clinical symptoms. Biochemical abnormalities usually coincide with the prodromal phase of the illness and may persist for several months. Anti-HBc IgM becomes detectable at symptom onset. Detectable levels of anti-HBc IgM may persist for many months, and detectable levels of anti-HBc IgG may persist for many years, if not a lifetime. Anti-HBs is the last serologic marker to become detectable, and it indicates that the infection is resolving. Anti-HBc IgA is not measured.

A 51 year old lady presents with a septic right knee joint. Joint aspiration is sent for culture and Streptococcus bovis is confirmed. She is treated with intravenous antibiotics for 2 weeks and a further 4 weeks of oral antimicrobial therapy.

Which investigation should be carried out next?

- Arthroscopy
- Chest X Ray
- Colonoscopy
- Lumbar spine X rays
- Synovial biopsy

| | | |
|---|---|---|
| ○ | Arthroscopy | 8% |
| ○ | Chest X Ray | 2% |
| ○ | Colonoscopy ✔ Correct answer selected | 84% |
| ○ | Lumbar spine X rays | 3% |
| ○ | Synovial biopsy | 3% |

Steptococcus bovis is an organism that is associated with colonic malignancy. Genomic reassociations have shown that S. bovis biotype 1 is associated with malignancy in 100% of cases and biotype 2 only in 25%. In this case S. bovis has seeded into the joint to produce a septic arthritis. As it is uncommon to isolate S. bovis in a joint, further follow up with colonoscopy is advised.

A 49 year old woman is admitted with a 3 day history of left flank pain, dysuria and fever. She has an 8 year history of type 2 diabetes for which she takes metformin and gliclazide together with Ramipril and simvastatin.

On examination her BMI is 35.3 $kg/m^2$, temperature is 38.5C, pulse 92 bpm and blood pressure 120/80 mmHg. She has oxygen sats of 97% on air and a respiratory rate of 22/min. She has some tenderness on the left flank but no masses are palpable.

Results show:

| | |
|---|---|
| Sodium | 136 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 12.1 mmol/l (3-8) |
| Creatinine | 128 micromol/l (50-100) |
| Haemoglobin | 13.3 g/l (120-160) |
| White cell Count | 12.8 $x10^9$/l (3-10) |
| Platelets | 158 $x10^9$/l (140-450) |
| C-Reactive Protein | 135 mg/dl (<5) |
| Glucose | 12.3 mmol/l |

| | |
|---|---|
| Platelets | 158 x$10^9$/l (140-450) |
| C-Reactive Protein | 135 mg/dl (<5) |
| Glucose | 12.3 mmol/l |
| HbA1c | 7.8% (<6) |
| Urinalysis | Red cells ++, leucocytes ++ |

Which of the following is the most appropriate treatment for this woman?

- IV amoxicillin
- IV cefuroxime
- Oral co-amoxiclav
- Oral nitrofurantoin
- Oral trimethoprim

| | | |
|---|---|---|
| IV amoxicillin ✖ Incorrect answer selected | | 18% |
| IV cefuroxime ← Correct answer | | 48% |
| Oral co-amoxiclav | | 18% |
| Oral nitrofurantoin | | 9% |
| Oral trimethoprim | | 7% |

This woman is likely to have urosepsis, as illustrated by evidence of infection plus temperature (>38.3), WCC (<4 or >12), heart rate (>90) and respiratory rate (>20). The most common organism is E Coli and therefore the most appropriate treatment is IV antibiotics Cefuroxime or Piperacillin/Tazobactam or ciprofloxacin

A 36-year-old man is evaluated for treatment of hepatitis C. He has not received interferon-based therapy, but is currently taking a complementary alternative medicine (CAM), the name of which he cannot recall. The patient's blood pressure is 156/92 mm Hg, and he has 1+ bilateral lower extremity edema. Laboratory studies are performed, and later that night, the laboratory calls because the serum potassium level is 2.6 mmol/L (3.5-5). The patient takes no other medication and has no history of hypokalemia. You suspect that the patient is taking which of the following?

- ○ Chinese herbal medicine
- ○ Glycyrriza glabra (licorice)
- ○ Silymarin (milk thistle)
- ○ St John's Wort
- ○ Thymic extract

| | | |
|---|---|---|
| Glycyrriza glabra (licorice) ✔ Correct answer selected | | 66% |
| | Silymarin (milk thistle) | 13% |
| | St John's Wort | 13% |
| ○ | Thymic extract | 2% |

All of these complementary alternative medications have been associated with adverse events. Licorice inhibits 11-ß-hydroxysteroid dehydrogenase, and this may lead to a pseudoaldosterone effect resulting in hypokalemia, sodium retention, and hypertension.

Multiple adverse events have been reported with milk thistle, but the most important relates to its ability to inhibit CYP3A4 and uridine diphospho glucuronosyl transferase. This may lead to interactions with traditional prescription medications such as quinine, lidocaine, certain calcium channel–blocking agents, and cyclosporine, all of which are metabolized in part by CYP3A4.

Chinese herbal medicine has been associated with possible hepatotoxicity, as well as pneumonitis, autoimmune hepatitis, and acute thrombocytopenic purpura.

St John's wort has been shown to cause multiple drug interactions through induction of the cytochrome P450 enzymes CYP3A4 and CYP1A2. This drug-metabolizing enzyme induction results in the increased metabolism of certain drugs, leading to decreased plasma concentration and potential clinical effect

A 53 year old man is admitted with a 3 day history of left leg pain and fever. He has an 8 year history of type 2 diabetes for which he takes metformin and gliclazide together with ramipril and simvastatin.

On examination his BMI is 32.3 kg/m2, his temperature is 38.5C, pulse 90 bpm and his blood pressure 120/80 mmHg. His left leg is swollen to mid-calf, the skin is red and inflamed with a clear demarcation just below the knee. He has some onycholysis of the left toe nails with some maceration between the toes. His peripheral pulses are all palpable.

Results show:

| | |
|---|---|
| Sodium | 136 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 12.1 mmol/l (3-8) |
| Creatinine | 128 micromol/l (50-100) |
| Haemoglobin | 13.3 g/l (120-160) |
| White cell Count | $12.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |
| C-Reactive Protein | 135 mg/dl (<5) |

| | |
|---|---|
| Platelets | $158x10^9$/l (140-450) |
| C-Reactive Protein | 135 mg/dl (<5) |
| Glucose | 12.3 mmol/l |
| HbA1c | 7.8% (<6) |

Which of the following would be the most appropriate treatment for this patient?

- IV flucloxacillin
- Oral amoxicillin
- Oral ciprofloxacin
- Oral flucloxacillin
- IV Vancomycin

| | |
|---|---|
| IV flucloxacillin ✔ Correct answer selected | 84% |
| Oral amoxicillin | 2% |
| Oral ciprofloxacin | 1% |
| Oral flucloxacillin | 10% |
| IV Vancomycin | 5% |

This patient has a clinical class II to class III cellulitis with systemic upset associated with a comorbidity. The vast majority of cases of cellulitis are due to beta haemolytic strep or S Aureus. Therefore, Flucloxacillin is the treatment of choice in this setting and recommended in guidelines as IV treatment in Class II-III patients. In subjects allergic to beta lactams, clarithromycin/clindamycin can be used.

- Guidance on management of cellulitis in adults

A 46 year old homeless man was admitted in a confused state. The manager of the hostel which he sometimes attended had been worried about him as he had become more confused and complained of headaches over the last 2 weeks and had been vomiting the last 2 days. He was known to abuse alcohol.

On examination, he was confused but had a GCS of 15 and had a temperature of 37.6C. Otherwise, neurological examination was unremarkable.

Relevant investigations:

CT head – mildly enlarged ventricles

Lumbar puncture revealed:

| | |
|---|---|
| Clear fluid | |
| Opening pressure | 30 cm/H20 (10 -20cm H20) |
| Total protein | 2.8 g/l (0.15-0.45) |
| Csf Glucose | 1.8 mmol(>3.3 mmol) |
| White cells | 52 and 100% lymphocytes (<5) |
| Plasma glucose at time of LP | 5.9mmol/l (3.5-5.5) |

Gram stain and AFB stain were both negative

The most likely diagnosis is:

- ○ Cryptococcal meningitis
- ○ Cytomegalovirus meningitis
- ○ Herpes Simplex encephalitis
- ○ Tuberculosis meningitis

Cryptococcal meningitis ✖ 31%

Incorrect answer selected

Cytomegalovirus meningitis 2%

Herpes Simplex encephalitis 24%

Tuberculosis meningitis ← 42%

Correct answer

This is Tuberculosis meningitis and empirical treatment is needed early here. Being homeless and heavy alcohol consumption are risk factors. The negative stains do not rule out TB meningitis and have a sensitivity of only 60%. TB meningitis classically has a raised opening pressure, lymphocytosis, raised protein and a very low glucose.

Bacterial meningitis would expect more neutrophils, viral meningitis typically has >60% serum glucose.

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| | |
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| Csf Glucose | 1.8 mmol(>3.3 mmol) |
| White cells | 52 and 100% lymphocytes (<5) |
| Plasma glucose at time of LP | 5.0mmol/l (3.3-5.5) |

Gram stain and AFB stain were both negative

The most likely diagnosis is:

- ○ Cryptococcal meningitis
- ○ Cytomegalovirus meningitis
- ○ Herpes Simplex encephalitis
- ○ Tuberculosis meningitis

# Tuberculosis

See the list below:

- Appearance: Clear or opaque
- Opening pressure: Elevated
- WBC count: 50-500 cells/µL (early PMN then lymph)
- Glucose level: Low
- Protein level: Elevated

Consider additional tests: CSF Gram stain and cultures, blood cultures, CSF bacterial antigens, CSF PCR, CSF tuberculosis culture/stain, others depending on clinical findings

You are called to see an 82 year old man on the ward who has developed offensive, watery diarrhoea. The man was admitted with chest infection and treated appropriately and, whilst awaiting home assessment and institution of a package of care, has developed diarrhoea associated with some abdominal pain.

He seems comfortable, his temperature is 37.3C, pulse 88 bpm and blood pressure 128/80 mmHg. He has some abdominal tenderness and some increased bowel sounds. His abdominal X-ray is normal and his blood results are normal with a CRP of 12 mg/dl (<5). faecal specimens have been sent and the patient is isolated.

Which of the following is the most appropriate approach to treating this patient?

- ○ No treatment currently required. Await cultures
- ○ Oral co-trimoxazole
- ○ Oral immodium
- ○ Oral metronidazole
- ○ Oral vancomycin

| | | |
|---|---|---|
| Oral metronidazole ✔ answer selected | Correct | 62% |
| Oral vancomycin | | 11% |

This patient is symptomatic with profuse watery diarrhoea, likely from the history to be due to C. Difficile infection. The patient should be treated with oral metronidazole as 1 st line therapy. In more severe cases complicated by systemic illness, oral vancomycin can be used. It is important to remember that supportive care should always be given, including attention to hydration, electrolytes and nutrition. Antiperistaltic agents should be avoided in acute infection due to risk of toxic megacolon. Metronidazole (or vancomycin, if appropriate) can be commenced if patient has diarrhoea AND one of the following: Positive C. difficile toxin test OR Results of C. difficile toxin test pending AND clinical suspicion of C.diff. That means treatment can be commenced if there is strong clinical suspicion while stool results are awaited.

A 78 year old lady with rheumatoid arthritis and type 2 diabetes mellitus presents with a chesty productive cough. Her medications include Metformin 1g bd, Methotrexate 15mg weekly, Folic acid 5 mg daily, and Prednisolone 5mg od. She is treated at home for a chest infection with a one week course of amoxycillin and makes a good recovery. Six weeks later she presents with severe lower lumbar back pain and is noted to have a temperature of 37C, a pulse of 100 bpm and a blood pressure of 138/78 mmHg. She is noted to have a left foot drop and a rash over the left shin which is waxy brown-yellow in colour.

Her investigations reveal:

| | | |
|---|---|---|
| **Haemoglobin** | 12.9 g/dL | (13 - 18 g/dL) |
| **WBC** | 15.3 $x10^9$/L | (4 -11 $x10^9$/L) |
| **Neutrophils** | 12.1 x $10^9$/L | (2 - 8 $x10^9$/L) |
| **Platelets** | 514 $x10^9$/L | (150 - 400 $x10^9$/L) |
| **CRP** | 53 mg/L | (< 10 mg/L) |
| **ESR** | 74 mm/hr | (< 40 mm/hr) |

| | | |
|---|---|---|
| **Ig M** | 2.4 g/L | (0.4 -2.3 g/L) |
| **Ig A** | 7.8 g/L | (0.6 -5.0 g/L) |
| **Ig G** | 12.1 g/L | (6.0 - 15.6 g/L) |

Serum Electrophoresis - increased alpha and beta globulins, no paraprotein detected.
Urine electrophoresis - Bence jones protein not detected

Lumbar spine X ray - Mild degenerative lumbar spondylotic changes.
Chest X Ray - Clear lung fields.

Which of the following is the most likely diagnosis?

- ○ Infective discitis
- ○ Lumbar spondylosis
- ○ Multiple myeloma
- ○ Osteoporotic fracture
- ○ Rheumatoid vasculitis

Infective discitis ✔ Correct answer selected — 55%

Lumbar spondylosis — 1%

Multiple myeloma — 3%

Osteoporotic fracture — 2%

Rheumatoid vasculitis — 39%

This lady has risk factors for infection - Type 2 Diabetes Mellitus and immunosuppression with methotrexate for rheumatoid arthritis. Probable haematogenous spread of infection after the recent chest infection, seems the most probable cause of the presentation, resulting in seeding of the infection at the lumbar intervertebral disc. She has nerve root signs at L4/5 with weak tibialis anterior affecting ankle dorsiflexion. Incidentally, the rash is the description of necrobiosis lipoidica diabeticorum, and not erythema nodosum or a vasculitis rash. Less than 50% of infective discitis patients have fever. Urgent MRI imaging is first choice here. CT guided biopsy can help to identify an organism if blood cultures remain negative, but only in 50% of cases. Staph. aureus and coagulase negative Staphylococci are the most common organisms. Tuberculosis should always be considered on the list of differential diagnoses in the immunosuppressed patient. The waxy-brown rash on the shin is a red herring and in this patient with diabetes suggests necrobiosis lipoidica diabeticorum.

A 62 year old man is admitted to MAU by his GP with a 5 day history of productive cough and feeling unwell. He has no other medical history of note. His cough is productive of a greenish sputum and he has become increasingly breathless. He is an ex-smoker, having stopped 10 years ago. He takes no medication.

On examination, he appears unwell, has a BMI of 28.5 kg/m2, a pulse of 90 bpm regular, a blood pressure of 124/68 mmHg and oxygen saturations on air of 94%. His temperature is 38.8C and his respiratory rate is 30. Auscultation of the heart is normal and examination of the chest reveals some crackles at the right base.

His results reveal:

| | |
|---|---|
| Sodium | 136 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 8.6 mmol/l (3-8) |
| Creatinine | 110 micromol/l (50-100) |
| Haemoglobin | 13.5 g/l (120-160) |
| White cell Count | $14.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |
| C-Reactive Protein | 128 mg/dl (<5) |

The chest x-ray reveals haziness at the right base.

Which of the following is the most appropriate treatment for this patient?

- ○ IV amoxicillin plus IV clarithromycin
- ○ IV ciprofloxacin
- ○ IV levofloxacin
- ○ Oral amoxicillin plus clarithromycin
- ○ Oral co-trimoxazole

IV amoxicillin plus IV clarithromycin ✖ Incorrect answer selected — 52%

IV ciprofloxacin — 0%

IV levofloxacin — 1%

Oral amoxicillin plus clarithromycin ← Correct answer — 46%

Oral co-trimoxazole — 1%

This man has a CURB-65 score of 2, suggesting moderately severe pneumonia, and requires admission and treatment with oral amoxicillin plus clarithromycin. IV treatment with benzylpenicillin/amoxicillin plus clarithromycin can be used in subjects who are unable to take oral treatment. There is no indication here that the patient is unable to take oral medication.

An 18 year old male of Asian origin was admitted feeling unwell with a headache that had developed over the last 24 hours. He was otherwise fit and well. His only recent travel history was a visit to Pakistan 2 months ago.

On examination, he had a temperature of 38.8C, some mild neck stiffness and mild photophobia. His pulse was 88 bpm, blood pressure 118/80 mmHg. No obvious rash was present and there were no abnormal neurology.

Results reveal:

| | |
|---|---|
| FBC | Normal |
| U+Es | Normal |
| CRP | 15 mg/dl (<5) |

CT head was reported as normal and the patient then went on to have a lumbar puncture, the results of which reveal:

| | |
|---|---|
| Appearance | Clear |
| Protein | 0.42 mg/l (<0.4) |
| Glucose | 4.2 mmol/l (>3.3) |
| White cells | 83/ul (0-5) |
| Red cells | 20 / ul (0-5) |

Which of the following is the most likely diagnosis?

- ○ Aseptic meningitis
- ○ Bacterial meningitis
- ○ Migraine
- ○ Subarachnoid haemorrhage
- ○ Tuberculous meningitis

| | | |
|---|---|---|
| Aseptic meningitis ✔ Correct answer selected | | 44% |
| Bacterial meningitis | | 15% |
| Migraine | | 0% |
| Subarachnoid haemorrhage | | 6% |
| Tuberculous meningitis | | 35% |

This patient is likely to have aseptic meningitis from the description in the history and the LP findings. The slight elevation of the WCC and protein would be in keeping with this diagnosis. We are not given any history regarding the microbiological assessment or gram staining of the CSF as is often the case. The patient should be treated with analgesia and can be discharged. The correct interpretation of the CSF is important in acute medicine and will be a focus in exams.

**Reference:**


- Interpreting the CSF results.

# Subarachnoid hemorrhage

See the list below:

- Appearance: Xanthochromia, bloody, or clear

- Opening pressure: Elevated

- WBC count: (1 additional WBC per 1000 RBCs is considered normal correction)

- Glucose level: Normal

- Protein level: Elevated

Consider additional tests: CSF Gram stain and cultures, others depending on clinical findings

# Aseptic (viral) meningitis

See the list below:

- Appearance: Clear
- Opening pressure: Normal or elevated
- WBC count: 10-1000 cells/µL (lymph but PMN early)
- Glucose level: >60% serum glucose (may be low in HSV infection)
- Protein level: Elevated (>50 mg/dL)

Consider additional tests: CSF Gram stain and cultures, blood cultures, CSF bacterial antigens, CSF PCR (eg, herpes simplex virus [HSV], varicella-zoster virus [VZV]), others depending on clinical findings

A 73 year old man is admitted to the MAU by his GP with a 5 day history of cough and feeling unwell. He has otherwise been well with no other history of note. His cough is productive of a greenish sputum and he has become increasingly breathless. He is a non-smoker. He informs you that he has a penicillin allergy. Otherwise he does not take any medication.

On examination, he has a BMI of 28.5 kg/m2, a pulse of 82 bpm regular, a blood pressure of 122/88 mmHg and oxygen saturations on air of 95%. His temperature is 38.5C. Auscultation of the heart is normal and examination of the chest reveals some crackles at the right base.

His results reveal:

| | |
|---|---|
| Sodium | 136 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 6.8 mmol/l (3-8) |
| Creatinine | 98 micromol/l (50-100) |
| Haemoglobin | 13.3 g/l (120-160) |
| White cell Count | $12.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |
| C-Reactive Protein | 55 mg/dl (<5) |

The chest x-ray reveals some haziness at the right base.

Which of the following is the most appropriate treatment for this patient?

- ○ IV cefotaxime
- ○ IV clarithromycin
- ○ Oral amoxicillin
- ○ Oral doxycycline
- ○ Oral levofloxacin

IV cefotaxime 2%

IV clarithromycin 3%

Oral amoxicillin 20%

Oral doxycycline ← Correct 39%

answer

Oral levofloxacin ✖ Incorrect 35%

answer selected

This patient has a community acquired pneumonia but is allergic to penicillin and therefore, according to guidance, could be treated with oral non-penicillin alternatives such as doxycycline or clarithromycin.

**Reference**

- BTS Guidance on CAP

A 20 year old female is admitted with nausea and vomiting which commenced after she ate a pizza approximately 4 hours earlier. She felt nauseous had some associated abdominal pain and developed profuse vomiting. She has been unable to keep anything down and has become weaker. She is 29 weeks pregnant with her second child and the pregnancy is doing well. Observations are generally fine, she seems slightly dehydrated yet investigations are normal. She is treated with an IV infusion of normal saline but is distressed by the vomiting.

Which of the following would be the most appropriate approach to managing the nausea and vomiting?

- ○ Continue IV fluids only and no anti-emetics
- ○ IV Dexamethasone
- ○ IV Metoclopramide
- ○ IV Ondansetron
- ○ IV Prochlorperazine

Continue IV fluids only and no anti-emetics 12%

IV Dexamethasone 5%

IV Metoclopramide ✔ Correct answer selected 36%

IV Ondansetron 24%

IV Prochlorperazine 22%

This young woman, who is in her second pregnancy, is likely to have acquired S Aureus food poisoning and is particularly symptomatic as a consequence. The most appropriate approach is to prescribe an antiemetic, and the drug with greatest safety data associated with its use in pregnancy is metoclopramide. Other recommended agents include antihistamines such as cyclizine.

A 27 year old man is referred urgently by his general practitioner with right shoulder pain. He is on no medication but admits to using intravenous heroin on a regular basis. On examination, he is pyrexial ($38.1^0$C) and examination of the anterior chest wall reveals tenderness and swelling over the right sternoclavicular joint. He has no other joint abnormalities.

An ultrasound is performed which reveals a fluid collection around the sternoclavicular joint. This is aspirated and 2mls of turbid fluid is sent for analysis. He is commenced on broad spectrum antibiotics intravenously. The culture is positive 24 hours later.

Given his history which of the following is the most likely cause of his septic arthritis?

- Haemophilus influenzae
- Polymicrobial infection
- Pseudomonas aeruginosa
- Staphyloccocus aureus
- Streptococcus pneumoniae

| | | |
|---|---|---|
| ○ | Haemophilus influenzae | 1% |
| ○ | Polymicrobial infection | 2% |
| ○ | Pseudomonas aeruginosa | 5% |
| ○ | Staphyloccocus aureus ✔ | 91% |
| | Correct answer selected | |
| ○ | Streptococcus pneumoniae | 2% |

Infection of the sternoclavicular joint is rare but represents 17% of joint infections in IV drug users versus 1% in the general population. Pseudomonas aeruginosa joint infection is considered to be more common in IV drug users but Staphylococcus aureus infection still remains the most common infective agent based on a recent review of 180 cases[1]. Despite this it may be important to cover both staphylococcal and pseudomonas infection until culture results are available in this patient.

A 73 year old man is admitted to MAU by the GP with a 5 day history of cough and feeling unwell. He has otherwise been well with no other history of note. His cough is productive of a greenish sputum and he has become increasingly breathless. He is a non-smoker.

On examination, he has a BMI of 28.5 kg/m2, a pulse of 82 bpm regular, a blood pressure of 122/88 mmHg and oxygen saturations on air of 95%. His temperature is 38.5C and he has a respiratory rate of 26/min. Auscultation of the heart is normal and examination of the chest reveals some crackles at the right base.

His results reveal:

| | |
|---|---|
| Sodium | 136 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 6.8 mmol/l (3-8) |
| Creatinine | 98 micromol/l (50-100) |
| Haemoglobin | 13.3 g/l (120-160) |
| White cell Count | $12.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |
| C-Reactive Protein | 55 mg/dl (<5) |

The chest x-ray reveals haziness at the right base.

Which of the following is the most appropriate approach to the management of this patient?

- ○ Admit to hospital and treat with IV amoxicillin
- ○ Admit to hospital and treat with IV amoxicillin and oral clarithromycin
- ○ Admit to hospital and treat with oral amoxicillin 500 mg tds
- ○ Discharge home and advise paracetamol
- ○ Discharge home with oral amoxicillin

Admit to hospital and treat with oral amoxicillin 500 mg tds 16%

Discharge home and advise paracetamol 0%

Discharge home with oral amoxicillin ✔ Correct answer selected 66%

This patient has a community acquired pneumonia. The important calculation here is the CURB-65 score which has prognostic significance. His CURB65 score is 1 and is calculated as follows:

| | |
|---|---|
| Confusion | 0 |
| Urea >7 | 0 |
| Respiratory rate >30 | 0 |
| BP Systolic <90, Diastolic <60 | 0 |
| 65 years or above | 1 |

Under these circumstances, the guidance with a CURB-65 of 0-1 suggests that the patient can be managed at home with oral amoxicillin.

Ufone 10:24 AM 31%
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| | | |
|---|---|---|
| Serum Creatinine | 89 mmol/l | 50-120 umol/l |
| S/Urea | 7 mmol/l | 2.5-6.7 mmol/l |
| CRP | 45 mg/l | <5 mg/l |

Urine Analysis:

| | |
|---|---|
| Pus Cells | Numerous |
| Leucocyte Esterase | +++ |
| Blood | ++ |

Which of the group of antibiotics can be started empirically by virtue of excellent cyst penetration?

- Amoxicillin & metronidazole
- Chloramphenicol & cefuroxime
- Ciprofloxacin & co-trimoxazole
- Gentamycin & cefixime
- Vancomycin & linezolid

Ufone 10:24 AM 31%
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A 56 year old gentleman known to have adult polycystic kidney disease presents to Accident and Emergency with complaints of pain in the left flank, fever, pyuria and dysuria. He regularly takes lisinopril 5 mg to control his hypertension.

On examination, he remains febrile with a temperature of 39 degree celsius, a pulse rate of 100/minute and a blood pressure controlled at 120/80 mmHg. He has tenderness over his left flank with both kidneys manually palpable. He has no other visceromegaly and has normal bowel sounds. You suspect a urine infection and get the following test results:

| | | |
|---|---|---|
| Hb | 13.4 g/dl | 13-18 g/dl |
| WBC | 14.7 x $10^9$/l | 4-11 x $10^9$/l |
| Platelets | 316 x $10^9$/ | 150-300 x $10^{9/l}$ |
| PT | 12 seconds | 12-14 seconds |
| APTT | 34 seconds | 30-46 seconds |
| Serum Creatinine | 89 mmol/l | 50-120 umol/l |

empirically by virtue of excellent cyst penetration?

Peer responses

| | |
|---|---|
| Amoxicillin & metronidazole | 4% |
| Chloramphenicol & cefuroxime | 5% |
| Ciprofloxacin & co-trimoxazole | 48% |
| ✔ Correct answer selected | |
| Gentamycin & cefixime | 37% |
| Vancomycin & linezolid | 5% |

Fluoroquinolones and cotrimoxazole are known to cross the cyst membranes. They cover the most commonly encountered bacteria in such scenarios i.e. E.coli, proteus, klebsiella and other enterobacteriaceae species. Cyst aspiration to culture the organism remains gold standard.

A 57-year-old woman is admitted with fever, malaise and soreness of the left leg. The foreleg has become increasingly red and painful over the last 24 hours. She is a type 2 diabetic and is well controlled on metformin and sitagliptin. She also takes ramipril and simvastatin. She describes being penicillin allergic, having had a rash when she had ampicillin in her youth. On examination she has a temperature of 38.9C, a pulse of 110 bpm and a blood pressure of 118/60 mmHg. She has an erythematous swelling of the left leg extending from the foot to the knee. Blood results reveal:

| Test | Result | Normal range |
|---|---|---|
| White cell count | 12.1x109/l | 3-10 |
| CRP | 180 mg/l | <5 |
| U+Es | Normal | |
| Glucose | 15.5 mmol/l | |

Which of the following is the most appropriate treatment for this patient?

- ○ Admit and commence IV clarithromycin
- ○ Admit and commence IV co-trimoxazole
- ○ Admit and commence IV flucloxacillin
- ○ Discharge on oral doxycycline
- ○ Discharge on oral flucloxacillin

| | |
|---|---|
| Admit and commence IV clarithromycin ✔ Correct answer selected | 51% |
| Admit and commence IV co-trimoxazole | 14% |
| Admit and commence IV flucloxacillin | 26% |
| Discharge on oral doxycycline | 9% |
| Discharge on oral flucloxacillin | 0% |

There are 2 considerations here. Firstly the question of whether to admit or not. The Eron class would suggest that the patient needs to be admitted; she is systemically unwell with tachycardia and pyrexia, and is also diabetic, so she would be classified as Eron class 3. Now it comes down to which treatment to select. This patient is penicillin allergic so a beta lactam should not be used. The alternatives recommended for penicillin allergic patients are either IV clarithromycin or IV clindamycin.

A 30-year-old woman with no past medical history was admitted with fever, breathlessness and a productive cough. She was not taking any regular medication and was not pregnant.

At presentation she had a blood pressure of 80/50 mmHg and was given 2 litres of rapid intravenous saline. Her vital signs were recorded again and were as follows:

| Test | Result | Normal ranges |
| --- | --- | --- |
| Temperature | 38°C | 36.1°-37.2°C |
| Respiratory rate | 26 breaths/min | 16–20 breaths/min |
| Heart rate | 110 bpm | 50–80 bpm |
| Blood pressure | 80/50 mmHg | 120/80 mmHg |
| Oxygen saturations on air | 92% | 95 to 100% |
| Venous blood gas lactate | 5 mmol/l | (0.5-1 mmol/l) |

| | | |
|---|---|---|
| Venous blood gas lactate | 5 mmol/l | (0.5-1 mmol/l) |

She is also confused. According to NICE guidelines, what should happen next?

- Arrange urgent ITU admission
- Immediate IV amoxicillin/clarithromycin
- Immediate dose oral cotrimoxazole
- IV bolus bicarbonate
- IV bolus hydrocortisone

Arrange urgent ITU admission 36%

Immediate IV amoxicillin/clarithromycin ✔ Correct answer selected 63%

Immediate dose oral cotrimoxazole 0%

IV bolus bicarbonate 0%

IV bolus hydrocortisone 1%

**Explanation**

NICE guidelines recommend that all patients aged 12 years and over who have suspected sepsis and 1 or more high risk criteria should receive an immediate senior review and a broad-spectrum antimicrobial at the maximum recommended dose without delay (within 1 hour of identifying that they meet any high risk criteria in an acute hospital setting)'.

Question ID #3576

A 62 year old man is admitted to MAU by his GP with a 5 day history of productive cough and feeling unwell. He has no other medical history of note. His cough is productive of a greenish sputum and he has become increasingly breathless. He is an ex-smoker having stopped 10 years ago. He takes no medication.

On examination, he appears unwell, has a BMI of 28.5 kg/m2, a pulse of 90 bpm regular, a blood pressure of 124/68 mmHg and oxygen saturations on air of 94%. His temperature is 38.8C and his respiratory rate is 30. Auscultation of the heart is normal and examination of the chest reveals some crackles at the right base.

His results reveal:

| | |
|---|---|
| Sodium | 136 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 8.6 mmol/l (3-8) |
| Creatinine | 110 micromol/l (50-100) |
| Haemoglobin | 13.5 g/l (120-160) |
| White cell Count | $14.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |
| C-Reactive Protein | 128 mg/dl (<5) |

The chest x-ray reveals haziness at the right base.

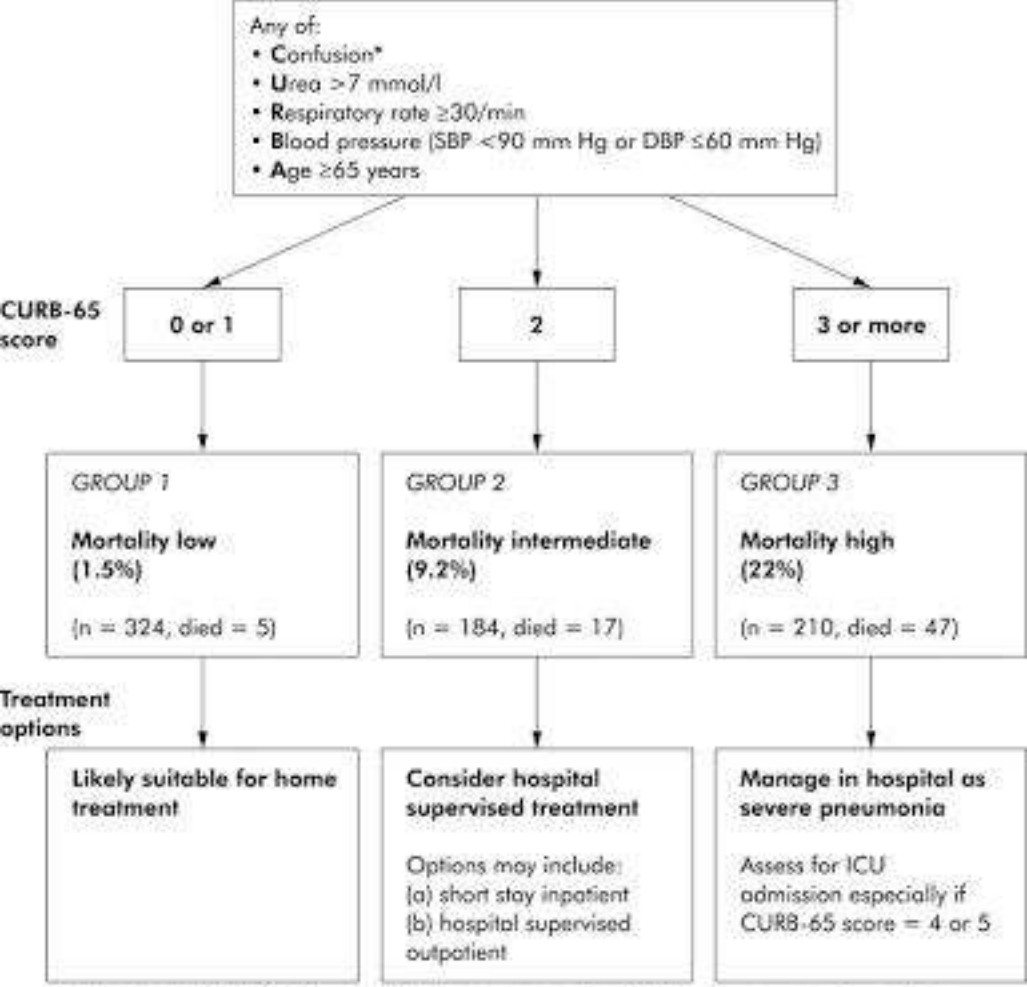
What is the CURB-65 score in this patient?

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4

| | |
|---|---|
| 0 | 0% |
| 1 | 5% |
| 2 ✔ Correct answer selected | 90% |
| 3 | 4% |
| 4 | 0% |

The CURB-65 score is a score used in community acquired pneumonia with prognostic value. His CURB65 score can be calculated as follows:

| | |
|---|---|
| Confusion | 0 |
| Urea >7 | 1 |
| Respiratory rate >30 | 1 |
| BP Systolic <90, Diastolic <60 | 0 |
| 65 years of age or above | 0 |


Any of:
• Confusion*
• Urea >7 mmol/l
• Respiratory rate ≥30/min
• Blood pressure (SBP <90 mm Hg or DBP ≤60 mm Hg)
• Age ≥65 years
CURB-65 score
0 or 1
2
3 or more
GROUP 1
Mortality low (1.5%)
(n = 324, died = 5)
GROUP 2
Mortality intermediate (9.2%)
(n = 184, died = 17)
GROUP 3
Mortality high (22%)
(n = 210, died = 47)
Treatment options
Likely suitable for home treatment
Consider hospital supervised treatment
Options may include:
(a) short stay inpatient
(b) hospital supervised outpatient
Manage in hospital as severe pneumonia
Assess for ICU admission especially if CURB-65 score = 4 or 5

*defined as a Mental Test Score of 8 or less, or new disorientation in person, place or time

# Acute Medicine SCE Revision

## Medicine in the elderly

A 78 year old man with a history of Parkinson's disease presents after his relatives became concerned as he had become increasingly confused, and had been shaking uncontrollably at times.

On examination the patient was drowsy, with increased rigidity in the limbs; pupils were normal. He had a noticeable tremor. Examination of the chest showed a right basal pneumonia, and the chest x-ray confirmed a right basal pneumonia.

Of significance in the investigations, Urea was 17.5 mmol/l (3-8), Creatinine 189 micromol/l (50-100), CRP was 120 mg/l (<5) and his Creatinine Kinase was 12626 iu/l (50-200).

You read from his letters on portal that bloods taken in the Parkinson's disease clinic 6 days previously had been in normal range. His Levodopa dose had been increased due to increased rigidity from sinemet 25/100 one tablet tds to 50/100 morning and evening and 25/100 midday.

With regards to his movement disorder, which treatment is the most appropriate?

- ○ Add catechol-O-methyltransferase inhibitor (entacapone) and increase Levodopa
- ○ Add sodium valproate
- ○ Decrease dose of levodopa
- ○ Increase dose of levodopa (sinemet)
- ○ Use i.v lorazepam

Add sodium valproate 0%

Decrease dose of levodopa ✔ 45%

Correct answer selected

Increase dose of levodopa (sinemet) 5%

Use i.v lorazepam 13%

The patient has features consistent with an acute hyperkinetic disorder. This is likely precipitated by increased Levodopa dose, and potentiated by community acquired pneumonia.

Acute hyperkinetic disorders can present as chorea, dystonia, choreoathetosis, and myoclonus. Often, the condition can be misdiagnosed as a seizure or severe tremor. Levodopa dosage should be adjusted gradually and the patient closely monitored for the effects of subtherapeutic therapy.

Continued dyskinetic movements can cause exhaustion, dehydration, trauma and rhabdomyolysis.

An 80 year old woman is admitted following an hour history of weakness and loss of speech affecting the left side of the body. By the time she is admitted the weakness has resolved and her speech is improving.

She has a history of hypertension for which she takes amlodipine 10mg daily. She also takes atorvastatin 10mg daily. Otherwise she is well with no other history of note.

On examination, her blood pressure is 144/80 mmHg and her pulse is 68 bpm regular.

Which of the following most accurately suggests the approximate risk of this patient having a stroke within the next week?

- <1%
- 5%
- 10%
- 25%
- 40%

2 Minute Medicine® **ABCD2 Score** 2minutemedicine.com

| Risk Factor | Points |
|---|---|
| **A**ge ≥60 years | 1 |
| **B**lood pressure elevation (systolic >140 mmHg and/or diastolic ≥90 mmHg) | 1 |
| *Clinical features* | |
| Unilateral weakness | 2 |
| Speech disturbance without weakness | 1 |
| *Duration of symptoms* | |
| ≥60 minutes | 2 |
| 10-59 minutes | 1 |
| **D**iabetes mellitus | 1 |

| ABCD2 Score | Patients | 2-day risk (%) | 7-day risk (%) | 90-day risk (%) |
|---|---|---|---|---|
| Low (0-3) | 1,628 | 1.0 | 1.2 | 3.1 |
| Moderate (4-5) | 2,169 | 4.1 | 5.9 | 9.8 |
| High (6-7) | 1,012 | 8.1 | 11.7 | 17.8 |

Table 1. The ABDC2 Score. | 2minutemedicine.com

The important issue here is to calculate this patient's ABCD2 score. The ABCD2 score is a risk assessment tool designed to stratify TIAs according to future risk of stroke.

A refers to age >60 =1

B refers to blood pressure with either systolic or diastolic >140/90 = 1

C – Clinical Features: Unilateral weakness with or without speech impairment =2. Speech impairment =1

D – Duration: 10-59mins =1. >60 mins = 2

2 – Type 2 diabetes = 1

In this case the patient scores 6 based on age, clinical features and duration. This suggests quite a high risk of future stroke of about 12% at 7 days, with guidance suggesting the patient be admitted, investigated and treated.

Ufone 11:36 AM 14%
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An 83 year old lady is admitted from home as she has been more breathless of late. She lives alone and usually manages well. She was seen by her daughter who felt she was more breathless than usual as she has a background of COPD associated with smoking. The GP decided to admit her. She used inhalers and took zopiclone at night to help her sleep. Other than some mild memory problems she had little else of note in her history. She did not drink any alcohol but smoked about 5 cigarettes daily.

On examination she seemed fine, her temperature was 37C, pulse 80 bpm reg and blood pressure 110/80 mmHg. Her oxygen saturations were 94% on air. Other than occasional wheeze there was nothing else of note on examination. Full blood count, U+Es were normal and her CRP was 15 mg/l (<5). She was given oral antibiotics by the night team and was to be reviewed by the consultant the following morning.

The following morning she was agitated, aggressive and would not let anyone perform any observations. She would lock herself in the toilet and felt that people were intent on harming her. She was walking around the unit quite unperturbed and did not otherwise seem distressed but would not permit any medical staff to go near her nor would she listen to what they were saying.

Which of the following is the most appropriate approach to the management of this patient?

- ○ Give chlorpromazine IV/IM
- ○ Give diazepam IV/IM
- ○ Give haloperidol IV/IM
- ○ Give lorazepam IV/IM
- ○ Move to a side room on a ward and just observe

Give haloperidol IV/IM ✔ 56%

Correct answer selected

Give lorazepam IV/IM 10%

Move to a side room on a ward and just observe 31%

This patient is acutely agitated, is likely to have mild dementia and may be delirious. It is therefore, important to assess the patient properly and for their own safety as well as staff safety, the patient should receive sedation. The most appropriate is a typical antipsychotic such as haloperidol. Benzodiazepines are not recommended in the elderly other than for delirium tremens as they are more respiratory sedatory.

Sedation would then enable this patient to be evaluated appropriately for delirium or any other cause of her agitation. In this case, the mild dementia, change of environment, possible use/dependence on zopiclone as well as infection may all contribute.

A 68 year old man is admitted on the acute medical take, via the GP, following repeated episodes of falling. He was living at home with a four times a day package of care, and family assistance, but had become increasingly dependent on his family as his mobility had significantly deteriorated over the past 6 months.

On admission the patient is complaining of hallucinations and is concerned that the nursing staff are "out to get him". He is not aggressive but his family states that these hallucinations have been worsening and at times he can be very disorientated and confused.

Physical examination is unremarkable apart from some minor cogwheeling rigidity in his hands, and a shuffling gait with reduced arm swing. He showed evidence of mild cognitive deficit on testing, and was unable to draw a clock.

Bloods were in the normal range, ECG showed normal sinus Rhythm and CT head showed mild small vessel disease.

He is finding the hallucinations to be distressing. What is the most appropriate treatment for this?

- ○ Haloperidol
- ○ Lorazepam
- ○ Pramiprexole
- ○ Rivastigmine
- ○ Trazadone

| | | |
|---|---|---|
| | Haloperidol | 18% |
| | Lorazepam | 19% |
| | Pramiprexole | 17% |
| selected | Rivastigmine ✔ Correct answer | 41% |
| | Trazadone | 5% |

The patient has features of Parkinsonism with a worsening mobility, frequent falls, fluctuating levels of lucidity and hallucinations suggesting a diagnosis of Lewy Body Dementia.

Anticholinergic medication and typical antipsychotics medication are contraindicated in Lewy Body Dementia. Anticholinergic medication increases the mortality when used in Lewy Body Disease three times above average.

A 70 year old woman presents to A&E with severe sudden onset vertigo. This episode developed over the period of an hour and now she is unable to stand and feels nauseous. She is uncomplaining of recent illness, nor tinnitus or hearing loss. She has had no similar episodes previously.

Neurological examination is unremarkable other than a horizontal beat nystagmus to the right. Her gait is normal although unsteady.

She has a history of hypertension and had previous cardioversion for atrial fibrillation 15 years ago following an episode of pneumonia. She is currently taking Ramipril for hypertension, with her blood pressure being 124/79 mmHg, and she is in sinus rhythm.

A CT head is reported as unremarkable.

She is adamant she needs to return home as soon as possible as she is carer for her brother who has advanced Parkinson's disease.

What is the next appropriate treatment?

- ○ Cinnarizine 30mg OD.
- ○ Lorazepam 0.5mg QDS
- ○ Perform an Epley manoeuvre
- ○ Prednisolone 40mg a day with a tapering dose
- ○ Prochlorperazine 5mg

What differentiates labyrinthitis or vestibular neuritis (VN)? from BPPV

---

| Labyrinthitis/VN | BPPV |
| --- | --- |
| a) No head movement needed | a. Requires head movement |
| b) Duration of hours/days | b. Duration of seconds |
| c) Any age | c. Usually in elderly |
| d) Viral syndrome usually precedes | d. No relation to viral syndrome |
| a) Epley maneuver is ineffective | e. Responds to Epley maneuver |

# VESTIBULAR NEURITIS

- Rapid onset of severe vertigo, nausea, vomiting, and imbalance.
- Symptoms gradually resolve over several days, but some symptoms can persist for months.
- Etiology - probably viral.
- Benign and self-limited

- Diagnosis - Peripheral vestibular pattern of nystagmus and a positive head-thrust test in the setting of a rapid onset of vertigo without other neurological symptoms.

Prednisolone 40mg a day with a tapering dose 3%

Prochlorperazine 5mg ← 20%

Correct answer

The patient has likely vestibular neuritis, this can cause rapid onset vertigo with no hearing loss or tinnitus, which are often a feature of Labyrinthitis.

NICE guidelines suggest Prochlorperazine either as an IM or Buccal preparation to treat Vestibular Neuritis. The treatment should be taken for 3 days and then tailed off with treatment limited to one week.

Cinnarizine should be avoided in the elderly, especially women and those with a family history or evidence of Parkinson's disease.

**Reference:**

- CKS, Vestibular neuronitis

An 83 year old man is admitted to hospital following a fall at home. His wife died a year ago and he has been living on his own since. His daughter found him at home as she had popped in to see him after work. He told her that he had fallen an hour or so before and had not been able to get up. She tells you that he has had increasing problems looking after himself and has had a couple of falls prior to this. On this occasion, the patient explains to you that he has had increasing problems with his muscle strength and he simply tripped over and gashed his head. He did not pass out but was unable to get up.

Currently he takes amlodipine 10 mg/d, simvastatin 40mg/d and omeprazole 10mg/d.

On examination, he is frail and has a superficial laceration to the right temporal region which has not required stitching. Observations are fine but he has a BMI of 20.5kg/m2 and has obvious sarcopenia, particularly with proximal muscle weakness. His pulse is 80 bpm reg and blood pressure is 142/78 mmHg lying and standing.

Which of the following is the most appropriate treatment fall prevention strategy for this man?

- ○ Stop amlodipine
- ○ Stop omeprazole
- ○ Thiamine treatment
- ○ Topical testosterone treatment
- ○ Vitamin D3 treatment

A 95 year old lady was admitted to the MAU from her residential home on account of increased difficulty mobilising secondary to left hip pain. She had recently suffered a minor viral upper respiratory tract infection.

She had a past medical history of type 2 diabetes, hypertension and chronic renal impairment for which she took sitagliptin, bendrofluazide and Ramipril. She also took combined calcium and vitamin D3 supplements 1g daily of calcium and 800iu D3.

Other than hip pain that had progressed over a 2 year period, she denied feeling unwell. Specifically she denied thirst or frequency and otherwise reported no health concerns. There was no history of weight loss.

Her observations and examination were unremarkable beside mild hypertension, discomfort and stiffness of her left hip noted when internally rotated. She was observed mobilising on her tripod and was found to be functionally at her baseline.

Investigations revealed:

| | |
|---|---|
| Calcium | 2.9 mmol/l (2.2-2.6) |
| Alkaline Phosphatase | 70 iu/l (30-150) |
| Albumin | 40 g/dl (35-45) |
| Phosphate | 1.25 mmol/l (0.8-1.4) |
| Sodium | 143 mmol/l (134-144) |
| Potassium | 4.1 mmol/l (3.5-5.5 |
| Urea | 13 mmol/l (3-8) |
| Creat | 154 micromol/l (50-100) |

FBC, LFT and CRP were normal. Hip X-ray revealed moderate-severe osteoarthritis in her left hip, no fractures or other abnormalities. Simple analgesics were initiated and an outpatient referral to the orthopaedic team arranged. Her combined calcium and vitamin D3 supplements were stopped. Aside from this, how else would you manage her hypercalcaemia?

- Admit for IV fluids and give SC calcitonin
- Admit for IV fluids – normal saline
- Admit for IV fluids with intravenous bisphosphonates
- Admit, treat with IV fluids and give denosumab
- Stop bendrofluazide, encourage liberal oral fluids, and discharge with view to repeating calcium in 2 days.

calcitonin

Admit for IV fluids – normal saline 34%

Admit for IV fluids with intravenous bisphosphonates 3%

Admit, treat with IV fluids and give denosumab 2%

Stop bendrofluazide, encourage liberal oral fluids, and discharge with view to repeating calcium in 2 days. ✔ Correct answer selected 59%

In this elderly lady's case the raised calcium is an incidental finding and she is on two medications that can precipitate hypercalcaemia – bendrofluazide and oral calcium – she may well have been tipped over causing this mild hypercalcaemia with her recent viral illness. She is mobilising reasonably well presently and an admission will likely adversely affect her functional state.

A 59 year old woman attends A&E on a Saturday after suddenly developing dysarthria, diplopia, numbness and weakness of the right face and left hand which lasted approximately 2 hours. The symptoms have now resolved but she describes the symptoms coming on suddenly, over minutes. In her past medical history, she is treated for hypertension, hyperlipidaemia and has stable intermittent claudication not requiring any surgical intervention. She takes amlodipine, simvastatin and aspirin. She is a smoker of 5 cigarettes daily.

On examination, her pulse is 88 bpm irregular, BP 150/85 mmHg but neurological and cardiovascular examination is otherwise normal. There is no carotid bruit. CT scan is normal.

Investigations show normal routine blood tests and an ECG reveals atrial fibrillation.

Which of the following is the most appropriate approach to the management of this patient?

- ○ Admit, risk factor modification, anticoagulation and and arrange urgent specialist review
- ○ Admit, arrange urgent specialist review, echo and MRI as inpatient
- ○ Discharge with risk factor modification and review in TIA clinic
- ○ Discharge with risk factor modification, anticoagulation and review in TIA clinic
- ○ Discharge with risk factor modification

Stop amlodipine 11%

Stop omeprazole 5%

Thiamine treatment 4%

Topical testosterone treatment 4%

Vitamin D3 treatment ✔ 76%

Correct answer selected

This elderly male patient has had a mechanical fall at home resulting in his admission to hospital. This is a very common occurrence and, according to guidance, this patient should be treated with at least 800iu vitamin D3 as part of a fall prevention strategy. It is highly likely that the patient has vitamin D deficiency and this may contribute to the sarcopenia and proximal muscle weakness. There is no evidence of postural hypotension so there would be no requirement to stop the amlodipine.

Admit, risk factor modification, anticoagulation and and arrange urgent specialist review ✔ Correct answer selected — 46%

Admit, arrange urgent specialist review, echo and MRI as inpatient — 27%

Discharge with risk factor modification and review in TIA clinic — 6%

Discharge with risk factor modification, anticoagulation and review in TIA clinic — 12%

Discharge with risk factor modification and anticoagulation following outpatient MRI with TIA clinic — 10%

This patient has presented with a typical TIA and requires risk factor assessment and modification, particularly blood pressure review and smoking cessation, together with anticoagulation – NOACS or warfarin are acceptable. The patient need not be admitted to facilitate this. There is a 10% risk of completed stroke following TLOF and this can be reduced by up to 80% with risk factor modification.

Recommendation from https://cks.nice.org.uk/stroke-and-tia#!scenario:1

- Discuss the need for admission or observation urgently with a stroke specialist if the person:
  - Has had more than one suspected TIA (sometimes known as crescendo TIA).
  - Has a suspected cardioembolic source or severe carotid stenosis. (our case fits in this category)
  - May be unable to attend for urgent review or lacks a reliable observer at home to contact emergency services if further symptoms occur.

A 75 year old female was assessed in A&E having been brought into hospital by her husband in a confused state. They had been walking back from the shops and he stated that she started constantly asking where they were and what they had just been doing. This continued in the emergency department but by the evening post take ward round she was back to her normal self, although she couldn't recall the events of the day. The husband who was with her the whole time did not observe any limb weakness or facial asymmetry. Observations and bloods were unremarkable.

The most likely diagnosis is?

- ○ First presentation of dementia
- ○ Hypoglycemic event
- ○ Temporal lobe epilepsy
- ○ Transient ischaemic attack
- ○ Transient global amnesia

A 75 year old woman presents to the MAU on Sunday with recurrent episodes of right hand numbness and slurred speech which have occurred on approximately 10 occasions over the last 2 weeks. The episodes are all very similar in nature, each lasting 10 to 40 minutes with complete resolution of the weakness and numbness. They tend to occur at any time of day and come on quite suddenly. In her past history she has been treated for hypertension with amlodipine and also takes simvastatin. She had a right hip replacement 3 years ago which was uneventful.

On examination, she feels that her symptoms have now entirely resolved and there are no neurological deficits on examination. Blood pressure is 136/84 mmHg. CT head scan is reported as normal.

Which of the following is the most appropriate approach to the management of this patient?

- ○ Admit and request specialist review
- ○ Admit, give antiplatelet therapy and specialist review
- ○ Discharge with no further follow up required
- ○ Discharge without antiplatelets and refer to TIA clinic
- ○ Give aspirin, discharge and organise TIA clinic referral

Ufone 2:29 PM 7%
studyprn.com

Peer responses

- First presentation of dementia 3%
- Hypoglycemic event 0%
- Temporal lobe epilepsy 1%
- Transient ischaemic attack 1%
- Transient global amnesia ✔ 95%

Correct answer selected

The nature of the symptoms – constant questions, then rapid full recovery with no memory of the event – is strongly suggestive of Transient global amnesia.

**Further reading**

- Transient Global Amnesia

Next

Exit

Peer responses

| | |
|---|---|
| Diabetic amyotrophy | 5% |
| Osteomalacia ✔ Correct answer selected | 66% |
| Polymyalgia rheumatica | 5% |
| Primary hypoparathyroidism | 12% |
| Statin-induced myositis | 14% |

This elderly woman has fallen and sustained a fracture. She has proximal muscle weakness associated with a low calcium and elevated alkaline phosphatase. This suggests vitamin D deficiency – osteomalacia. The patient should be treated with vitamin D supplementation with or without supplemental calcium, depending on her nutritional intake. A reasonable approach to treating vitamin D deficiency is either D3 3200iu daily for 3 months or 60000 weekly for 5 weeks, followed by a maintenance dose of 800iu daily. Guidance suggests a reduction in falls associated with vitamin D therapy and that it is a very common entity in the elderly, a consequence of reduced sunlight exposure and reduced ability to photosynthesise D3 in the skin.

It is not PMR as this would not account for the hypocalcaemia and similarly the CRP does not suggest an underlying inflammatory process.

An 83 year old woman is admitted from home following a fall and sustaining a fracture of the humerus. On this occasion, the patient explains to you that she has had increasing problems with weakness and she fell over injuring her arm. She has had a number of falls previously but, on this occasion, she fractured her humerus and was seen by the A&E team, who recommended a sling and immobilisation. They have requested a medical opinion as it is unlikely the patient can be discharged due to social circumstances. You establish she did not pass out and this was a mechanical fall.

Currently she takes amlodipine 10 mg/d, simvastatin 40mg/d and omeprazole 10mg/d.

On examination, she has a BMI of 20 kg/m2 and her left arm is in a sling. There is little else to note other than loss of muscle bulk and proximal weakness.

Investigations reveal:

| | |
|---|---|
| Sodium | 136 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 12.1 mmol/l (3-8) |

| | |
|---|---|
| Creatinine | 128 micromol/l (50-100) |
| Haemoglobin | 13.3 g/l (120-160) |
| White cell Count | $4.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |
| C-Reactive Protein | 5 mg/dl (<5) |
| Glucose | 6.4 mmol/l (3.5-5.5) |
| Calcium | 2.16 mmol/l (2.2-2.6) |
| Alkaline Phosphatase | 135 iu/l (50-120) |

Which of the following is the likely contributory diagnosis to this patient's fall?

- (●) Diabetic amyotrophy
- ( ) Osteomalacia
- ( ) Polymyalgia rheumatica
- ( ) Primary hypoparathyroidism
- ( ) Statin-induced myositis

to surgery?

Peer responses

| | |
|---|---|
| Give fresh frozen plasma | 12% |
| Give IV prothrombin complex concentrate ✔ Correct answer selected | 70% |
| Give IV tranexamic acid | 6% |
| Give IV vitamin k | 1% |
| No prior treatment required; patient can undergo neurosurgery | 11% |

This patient is taking one of the direct oral anticoagulants (NOAC), apixaban which is a direct Xa inhibitor and has developed a subdural haematoma following a fall. Surgery is deemed necessary due to clinical deterioration and therefore the anticoagulative effect of apixaban should be reversed with a PCC such as octaplex or factor vIIIa inhibitor bypass activity.

**References:**

An 81 year old man is admitted following a fall at home. It was a mechanical fall but he stumbled and cracked his head. He is not sure if he passed out or not but was dazed, gashed the side of his head and called an ambulance. In his past medical history, he takes apixaban for lone atrial fibrillation.

On admission his GCS was 15, he had a laceration to his left temporal region which had now stopped bleeding. Neurological examination was normal but a CT head scan was performed and it revealed a left subdural haematoma. On coming back from CT scan, his GCS deteriorated to 12. The neurosurgeons were contacted and intend to transfer for urgent evacuation.

Which of the following should be undertaken prior to surgery?

- ○ Give fresh frozen plasma
- ○ Give IV prothrombin complex concentrate
- ○ Give IV tranexamic acid
- ○ Give IV vitamin k
- ○ No prior treatment required; patient can undergo neurosurgery

Admit and request specialist review 6%

Admit, give antiplatelet therapy and specialist review ✔ Correct answer selected 61%

Discharge with no further follow up required 0%

Discharge without antiplatelets and refer to TIA clinic 0%

Give aspirin, discharge and organise TIA clinic referral 32%

This patient presents with transient loss of function which is typical of TIAs within the carotid territory. This is crescendo TLOF where 2 or more events occur within 1 week, signifying a bad prognosis. The patient requires admission as there is a significant risk of a full blown stroke, and also requires appropriate specialist stroke review with risk factor assessment including carotid dopplers and echo.

An elderly man with advanced Alzheimer's Dementia (bed bound, uncommunicative, very limited understanding, doubly incontinent and on a thickened diet) was admitted by ambulance to A&E from his nursing home on account of haematemesis. He had 2 episodes: one in the nursing home and a second witnessed by the paramedics. The volume was estimated to have been about 20ml/episode. His usual medication included aspirin.

On examination, he appeared comfortable, with no apparent epigastric tenderness; his observations were normal (respiratory rate 18, saturations 97% on air, blood pressure 140/90, pulse 88bpm). His pads were wet and there was no melaena on rectal examination.

His bloods returned revealing a haemoglobin 140 g/l (120-160), white cell count 7x109/l (3-10), platelet 200x109/l (200-400), U&E, lactate and coagulation screen were normal.

His condition was discussed with his family and they agreed with the clinician that resuscitation in the event of cardiopulmonary arrest was not in his best interests.

He remained well in the department and his bloods

the event of cardiopulmonary arrest was not in his best interests.

He remained well in the department and his bloods were repeated 6 hours later with a haemoglobin of 13 g/l.

Which of the following would you advocate is the most appropriate plan here aside stopping his aspirin and starting proton pump inhibitors?

- Admit and refer to surgeons for review
- Admit for an inpatient endoscopy
- Admit overnight for observation and repeat FBC tomorrow and manage according to that result
- Discharge and arrange outpatient endoscopy
- Discharge with advice for his GP to review him should there be further concerns

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- Discharge with advice for his GP to review him should there be further concerns

Admit for an inpatient endoscopy 16%

Admit overnight for observation and repeat FBC tomorrow and manage according to that result 39%

Discharge and arrange outpatient endoscopy 12%

Discharge with advice for his GP to review him should there be further concerns ✔ Correct answer selected 32%

As this gentleman has end stage Alzheimer's and his management is primarily about symptom support and tender loving care, further investigation is not required and a palliative management plan should be developed. A cause is apparent in relation to his aspirin therapy and his results do not suggest substantial blood loss based on the normal urea, wet pads (suggesting uncompromised urine output) and a repeat Hb that is reassuring.

Today, 15:39

Admit, give antiplatelet therapy and specialist review ✔ Correct answer selected — 61%

Discharge with no further follow up required — 0%

Discharge without antiplatelets and refer to TIA clinic — 0%

Give aspirin, discharge and organise TIA clinic referral — 32%

This patient presents with transient loss of function which is typical of TIAs within the carotid territory. This is crescendo TLOF where 2 or more events occur within 1 week, signifying a bad prognosis. The patient requires admission as there is a significant risk of a full blown stroke, and also requires appropriate specialist stroke review with risk factor assessment including carotid dopplers and echo.

Question ID #4222

An 80 year old woman was admitted to A&E following a collapse in church. She had a medical history of hypertension maintained on ramipril, amlodipine and atenolol. She also takes aspirin 75mg daily as she had a TIA in the past. She is usually independent and lives with her husband who is in good health for his age. Six months ago she recalls a similar episode whilst waiting at the bus stop on a hot day. She recalled standing still during the church service and feeling light headed and nauseous around the time of the collapse. She believes she blacked out. Witnesses observed her to jerk as she hit the floor but she was alert and able to speak coherently within minutes of the event. Assessment revealed a bump on her brow otherwise neurological, cardiovascular and systems examinations were unremarkable. Her GCS was 15. Her ECG revealed sinus rhythm with a heart rate of 50 bpm and her blood pressure was recorded as 110/70 mmHg with no postural drop. Her routine bloods were satisfactory as was a CT of her head. ECG reveals sinus rhythm with a rate of 50/min. What do you believe is the most appropriate management aside stopping the atenolol?

of her head. ECG reveals sinus rhythm with a rate of 50/min. What do you believe is the most appropriate management aside stopping the atenolol?

- ○ Admit and refer for a cardiology opinion
- ○ Admit overnight for observation and arrange a 24 hour tape for further investigation as an outpatient
- ○ Discharge and arrange a cardiology outpatient referral
- ○ Discharge with head injury advice, stop aspirin and advise GP to monitor antihypertensive therapy
- ○ No further action or investigations required as it was a one off fall

Admit and refer for a cardiology opinion 6%

Admit overnight for observation and arrange a 24 hour tape for further investigation as an outpatient ← Correct answer 53%

Discharge and arrange a cardiology outpatient referral ✖ Incorrect answer selected 12%

Discharge with head injury advice, stop aspirin and advise GP to monitor antihypertensive therapy 29%

No further action or investigations required as it was a one off fall 0%

The history here is typical of a vasovagal collapse (vagal symptoms- low BP and Heart rate; lightheadedness and nausea) and does not suggest cardiac syncope (typically no warning symptoms often associated with significant injuries). In addition her low BP and bradycardia are contributing to her susceptibility to faint and are probably related to the beta blockade. Hence stopping the beta blocker is appropriate. In view of bradycardia it is possible that she may be having pauses contributing to falls, hence a 24 hour tape esp after stopping atenolol - if bradycardia persist- may be a reasonable option.

An 87-year-old woman presents to you with symptoms of dizziness which developed a few weeks ago. She finds the symptoms very difficult to describe, but she states she feels very unstable and it is hard to maintain her balance. These episodes occur on sudden standing and on movement, especially on looking upwards and bending over. She says she feels nauseous during the episodes, which last around a minute, although she feels lightheaded for up to a few hours after the event. She has fallen on standing when getting out of bed and when out shopping in the past week.

She has a history of hypertension and ischaemic heart disease, and is on bisoprolol, ramipril and clopidogrel.

On examination she has a lying blood pressure of 118/78 mmHg and a resting heart rate of 70 bpm (sinus rhythm). Her standing blood pressure is 115/75 mmHg immediately and 120/82 mmHg after 3 minutes of standing, and her heart rate remains stable at 70 bpm throughout the examination. She has no obvious focal neurology when reclining on an examination bench and examination of the cranial nerves is normal.

remains stable at 70 bpm throughout the examination. She has no obvious focal neurology when reclining on an examination bench and examination of the cranial nerves is normal.

Examination of her cardiovascular, respiratory and abdominal systems is unremarkable.

What is the most likely diagnosis?

- Benign paroxysmal positional vertigo
- Hyperventilation syndrome
- Meniere's disease
- Orthostatic/postural hypotension
- Vestibular neuritis/labyrinthitis

| | |
|---|---|
| Benign paroxysmal positional vertigo ✔ Correct answer selected | 68% |
| Hyperventilation syndrome | 1% |
| Meniere's disease | 7% |
| Orthostatic/postural hypotension | 12% |
| Vestibular neuritis/labyrinthitis | 11% |

The patient is complaining of dizziness with specific movements of her head; these can include looking upwards, turning in bed or bending over.

The vertigo involved normally lasts a few seconds to a minute (usually less than 30 seconds), and feelings of nausea may develop, although vomiting is rare, and lightheadedness and imbalance may be reported which can last for hours after the attack.

Hearing loss and tinnitus are not features of benign paroxysmal vertigo (unless pre-existing).

The Dix-Hallpike test (manoeuvre) is used to diagnose benign paroxysmal positional vertigo.The above patient has no contraindications to this test which include back and neck problems and carotid stenosis.

The below is a video of this test:

A 70 year old man presents after a transient ischaemic attack involving weakness of the left arm and lasting approximately 2 hours. He has a past medical history of diabetes for which he takes metformin 1g bd, together with simvastatin 40mg daily and ramipril 10mg daily.

On presentation, his weakness has now entirely resolved. He has a pulse of 80 bpm regular and a blood pressure of 148/92 mmHg.

Which of the following denotes this man's ABCD2 score?

- 1
- 3
- 5
- 6
- 7

7 ✔ Correct answer selected 42%

The ABCD2 score is a risk assessment tool designed to stratify TIAs according to future risk of stroke.

A refers to age >60 =1

B refers to blood pressure with either systolic or diastolic >140/90 = 1

C – Clinical Features: Unilateral weakness with or without speech impairment =2. Speech impairment =1

D – Duration: 10-59mins =1. >60 mins = 2

2 – Type 2 diabetes = 1

In our example, the age =1, blood pressure =1, Clinical features =2, duration =2 and he has diabetes =1

The score is therefore 7 which is the maximal score indicating a high risk of a completed stroke 2, 7, 30 and 90 days after a TIA. With an ABCD2 score of 6-7 there is an approximate 10% risk of stroke at 7 days and the recommendation in this case is one of admission with observation.

# Acute Medicine SCE Revision Musculoskeletal system

A 38 year old Russian lady attends A+E with pain in her right knee on a background of rheumatoid arthritis. Her disease has responded well to sulfasalazine since she was diagnosed 4 years ago. Today she complains of warmth, pain and swelling of the right knee, but is able to weight bear. Her knee has been troublesome for the past month and last week her GP started her on Prednisolone 7.5 mg. She has recently spent 3 months in Russia caring for her mother who is recovering from a stroke, and the patient returned to this country 3 weeks ago. Whilst in Russia she had an adequate supply of sulfasalazine, and was able to continue her blood monitoring with a local GP. She suffered a purulent cough for approximately 1 week whilst abroad, but resolved within 7 days. Her other joints remain quiescent. She has lost 1 stone in weight since her last clinic visit 6 months ago. Clinical examination revealed a large right knee effusion with the knee held in 5 degrees of fixed flexion. The knee was not particularly warm or tender. The small joints of her hands and feet were not swollen or tender.

You proceed to aspirate the joint, and 50 ml of turbid synovial fluid is withdrawn.

Results of joint aspiration reveals:

| | |
|---|---|
| **Synovial fluid Gram stain:** | no organisms seen |
| | numerous lymphocytes |
| | scanty polymorphs |
| **Synovial fluid Ziel-Nielsen stain:** | negative |
| **Tuberculin skin test** | negative |

Other investigations show:

Other investigations show:

| | |
|---|---|
| **Haemoglobin** | 12.4 g/dL (13-15 g/dL) |
| **WBC** | 12.1 (4-11x $10^9$ /L) |
| **Platelets** | 320 (150-400 x $10^9$ /L) |
| **MCV** | 82 fL (80-100fL) |
| **Sodium** | 136 mmol/L (135-145 mmol/L) |
| **Potassium** | 4.4 mmol/L (3.5-5.0 mmol/L) |
| **Urea** | 6.4 mmol/L (2.5-7.0 mmol/L) |
| **Creatinine** | 98 micromol/L (70-110 micromol/L) |
| **Bilirubin** | 14 micromol/L (5-17 micromol/L) |
| **ALT** | 36 IU/L (5-40 IU/L) |
| **ALP** | 90 IU/L (30-110 IU/L) |
| **Albumin** | 40 g/L (35-50 g/L) |
| **Protein** | 78 g/L (60-80 g/L) |
| **Globulin** | 38 g/L (22-32 g/L) |
| **CRP** | 45 mg/L (<5 mg/L) |
| **ESR** | 48 mm/h (<10 mm/h) |

Which of the following investigations is most likely to yield the diagnosis?

- ○ Blood cultures
- ○ MRI Knee
- ○ Synovial biopsy
- ○ Synovial fluid Mycobacterial PCR
- ○ Synovial fluid TB culture

Synovial biopsy ✔ Correct answer selected 12%

Synovial fluid Mycobacterial PCR 58%

Synovial fluid TB culture 12%

This lady is likely to have tuberculous arthritis of the knee. Around 80% of new cases of mycobacterium tuberculosis (MTB) occur in sub-Saharan Africa and Asia, but the infection is increasingly seen in Eastern Europe, particularly multi drug resistant forms of the mycobacterium[1]. Typically, MTB arthritis presents with chronic monoarthritis of the knee or hip, which account for 85% of cases. Other joints which are less frequently involved include shoulder, sacroiliac, elbow, ankle, and small joints of the hands and feet.

Synovial biopsy is most likely to confirm the diagnosis with a reported yield of 90% [1]. Synovial fluid microscopy has a sensitivity of 20-40%, and synovial fluid culture (which can take longer than 6 weeks) is 80% sensitive. MRI can demonstrate synovitis, pannus and erosion in the knee during the early stages of infection but would not confirm the diagnosis. Synovial fluid PCR for TB has a reported sensitivity of 73.9% [2] Blood cultures are often negative in tuberculosis.

Immunocompromise can cause a false negative tuberculin skin test. In such patients it is now possible to test for gamma interferon producing T cells, but the availability and sensitivity of these tests (e.g. Quantiferon, T-Spot) are variable.

References:

A 25 year old Armenian man is seen in outpatients clinic for follow up. He presented with a several year history of intermittent fevers, sharp central chest and abdominal pains. During attacks he complains of pain in his knees and ankles as well as a red rash on his legs.

Investigations for lymphoma and tuberculosis return normal. Serial blood cultures and serum viral PCR analysis was negative. Genetic tests confirmed the presence of the MEFV (Mediterranean Fever) gene. You explain the results of the genetic tests to your patient. He has ongoing symptoms, and is now having difficulty continuing his work as a carpenter. He asks directly regarding treatment for his symptoms.

Which of the following treatment options is most appropriate?

- Colchicine as required during febrile attacks
- Regular colchicine
- Prednisolone
- Hydroxychloroquine
- Paracetamol

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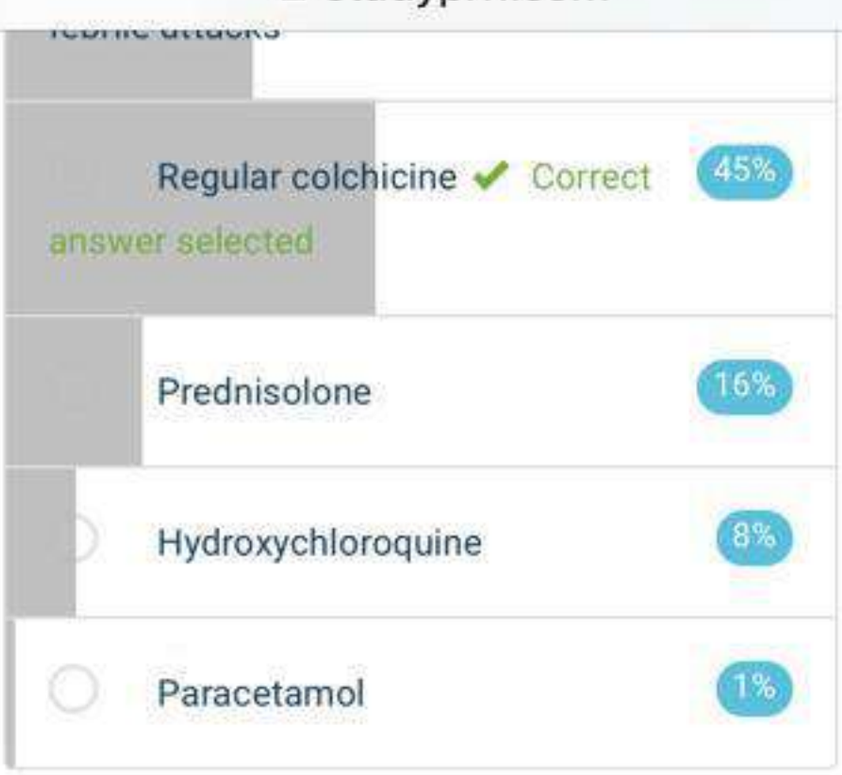


Familial Mediterranean Fever (FMF) is one of several heritable autoinflammatory diseases. It is characterised clinically by attacks of persistent fever, serosal inflammation (peritonitis,pleuritis, scrotitis, pericarditis), arthralgia of large joints, and erythema of the lower limbs reminiscent of erysipelas. Most cases present before the age of 5 years. The length of attacks vary from a few hours to approximately 4 days. Inflammatory attacks may be triggered by stress, viral disease during infancy and drugs including metaraminol and cisplatin. The key complication of chronic FMF is AA amyloidosis, and if untreated leads to nephropathy.

As the name suggests, FMF affects patients of Mediterranean heritage, including Turkish, Armenian, Arab and Greek populations. Understanding of the disorder has advanced greatly since the advent of genomic analysis. The gene for FMF, is known as MEFV and is found on the short arm of chromososme 16. It is expressed in myeloid cells and encodes a protein known as marenotrin / pyrin. This protein interacts with other proteins including apoptotic speck protein (ASC) triggering the release of IL-1ß, via the mediators

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The correct answer therefore is B, since colchicine taken as required will not protect against amyloidosis. Prednisolone in the long term will cause unacceptable side effects, and there is no evidence to support the use of either hydroxychloroquine or paracetamol in treating FMF.

A 22 year old man with type 1 diabetes is seen on the acute medical ward with a one week history of chest pain and localised chest wall swelling. He is a keen rower and has recently increased his training regime. His diabetes is controlled with subcutaneous insulin although he admits his control is difficult due to his training regime. His only current medication is topical benzoyl peroxide for facial acne.

His temperature is 38.2°C and examination of the chest demonstrates tender swelling over the left third and fourth costochondral cartilages. Investigations reveal:

| | |
|---|---|
| **CRP** | 42 mg/dl (<5) |
| **WBC** | $19x10^9$/l (4-11) |
| **Neutrophils** | $15x10^9$/l (2.0-7.5) |
| **Haemoglobin** | 15 g/dl (13.5-17.7) |

Which of the following is the most likely diagnosis?

- ○ Athlete associated costochondritis
- ○ Infective costochondritis
- ○ SAPHO syndrome
- ○ Sarcoma
- ○ Tietzes

Athlete associated costochondritis 13%

Infective costochondritis ← 46%

Correct answer

SAPHO syndrome ✖ Incorrect answer selected 25%

Sarcoma 0%

Tietzes 16%

Infective costochondritis is most commonly seen in patients with pre-disposing factors to infection such as diabetes mellitus, rheumatoid arthritis and long term haemodialysis[1]. Although Tietzes' syndrome would cause the swelling and tenderness, it is not associated with fever or leucocytosis. Although this man has acne and costochondritis he has no other features of the SAPHO (synovitis, acne, pustulosis, hyperostosis and osteomyelitis) syndrome, his facial acne is not likely to be significant as it is reasonably common in young men. Given the rapid onset sarcoma is highly unlikely. Costochondritis is also commonly seen in athletes in particular rowers, although this is not usually associated with swelling, fever or leucocytosis

A 42 year old caucasian woman with no past medical history of note, no current medication, no family history or history of foreign travel, presents to A&E with dyspnoea. On examination she is dyspnoeic at rest, there are bibasal crackles and she has a loud diastolic murmur heard best at the sternal edge. Her pulse is 106 bpm regular but collapsing in nature. She also has a collapsed nasal bridge. She is ANA, ENA and ANCA negative.

Which of the following is most likely to be the cause?

- Cocaine use
- Congenital Syphilis
- Leishmaniasis
- Relapsing polychondritis
- Wegener's granulomatosis

| | |
|---|---|
| Leishmaniasis | 1% |
| Relapsing polychondritis ✔ Correct answer selected | 38% |
| Wegener's granulomatosis | 26% |

Relapsing polychondritis is an autoimmune or autoinflammatory condition where recurrent inflammation of the cartilage is the key finding. After auricular inflammation involvement of the nasal cartilage is the most common cartilaagenous finding and can lead to collapse of the bridge.

It can be primary or secondary and associated with many of the systemic vasculitides, including Behcet's syndrome or polyarteritis nodosa, rheumatoid arthritis, SLE, Sjogren's syndrome, myelodysplastic syndromes and haematological malignancy as well as many other conditions.

Although it is frequently a mild condition it can be severe and life threatening with laryngotracheal involvement, renal involvement with mesangial disease and IgA nephropathy or aortitis leading to

aortic root dilatation. In this case the dyspnoea is secondary to cardiac failure caused by aortic regurgitation.

Congenital syphilis can also cause collapse of the nasal bridge and aortitis but symptoms appear earlier in life typically as structures are developing.

Wegener's granulomatosis is unlikely as the ANCA is negative.

Three forms of leishmaniasis have been described but only cutaneous leishmaniasis of the new world (American cutaneous leishmaniasis), caused by L.Braziliensis, is associated with involvement of the nasal cartilages. Leprosy can also involve the nasal cartilages.

Cocaine abuse tends to cause destruction of the nasal septum. It can cause cardiac failure but associated with arrythmias rather than valvular disease.

Reference:


- Eular Compendium on rheumatic diseases. BMJ publishing 2009. p364
- Kumar and Clark.Clinical medicine 7th edition. Saunders limited 2009.

A 24 year old girl is referred to you by her GP. She has had a flitting arthralgia and an Achilles tendonitis for 6 weeks and has now developed a swollen left knee. She also had a maculo-papular rash across her trunk although it is now healing. She has felt lethargic and has been pyrexial. On examination her knee is very swollen and warm. There is a fixed flexion deformity and active and passive flexion is significantly limited. There is mild swelling of the Achilles tendon.

Aspiration of the knee is performed and microscopy and culture reveal Neisseria gonorrhoeae infection.

On microscopy the organisms seen would be?

- ○ Gram negative diplococci
- ○ Gram negative rods
- ○ Gram positive bacilli
- ○ Gram positive cocci
- ○ Gram positive diplococci

| | |
|---|---|
| Gram negative diplococci ✔ Correct answer selected | 83% |
| Gram negative rods | 4% |
| Gram positive bacilli | 1% |
| Gram positive cocci | 1% |
| Gram positive diplococci | 11% |

Neisseria gonorrhoeae is a gram negative diplococci. It is sexually transmitted and most commonly affects young people with current rates highest in males aged 20-24 years and females aged 16-19 years. Only 25 % of men report genital infection (burning dysuria and discharge). Cervicitis is frequently asymptomatic. The associated arthritis is more commonly seen in women (1:3) as are the other disseminated features (endocarditis, myocarditis, pericarditis, conduction abnormalities, hepatitis and meningitis).

An 82 year old woman presents with intermittent pain and swelling of the wrists, metacarpophalangeal joints and proximal interphalangeal joints for a year. She also has an olecranon bursitis. In the past she has had bilateral knee replacements. On examination she has a warm swollen left wrist and Heberden's and Bouchard's nodes. She is hypertensive and has moderate renal impairment with a creatinine of 161 (normal range 79-118 micromol/L).

What would you do next?

- ○ Aspirate and send fluid for crystals and MC&S
- ○ Request anti-CCP
- ○ Request bloods cultures
- ○ Request serum urate
- ○ X-ray her hands

| | |
|---|---|
| Aspirate and send fluid for crystals and MC&S ✔ Correct answer selected | 48% |
| Request anti-CCP | 17% |
| Request bloods cultures | 0% |
| Request serum urate | 4% |
| X-ray her hands | 31% |

The most likely diagnosis in this case is pseudogout presenting with a pseudorheumatoid pattern of chronic, recurrent swelling affecting primarily large joints. It is often associated with inflammatory symptoms such as stiffness, pyrexia, and malaise. A monoarticular presentation is typical.

However any patient presenting with a warm swollen joint must have the joint aspirated and sent for urgent gram stain, culture and microscopy to exclude a septic arthritis. It is likely the microscopy will provide the diagnosis by showing brick shaped, weakly positively birefringent crystals but it should be remembered that crystals may still be seen in a septic joint.

Reference:

An 58 year old man with longstanding gout is admitted with a further flare in his left knee which is effectively treated with aspiration and steroid injection. He only has one kidney as he is a kidney donor. He has had 3 attacks of gout in the last 4 months despite taking 600mg per day of allopurinol. He uses colchicine for acute attacks and takes Atenolol 50mg per day for hypertension. Recent investigations reveal the following:

| | | |
|---|---|---|
| **Creatinine** | 140 umol/L | (50-100) |
| **Uric Acid** | 520 umol/L | (110-420) |

Which of the following alternatives to allopurinol is the recommended next step in management?

- ○ Commence Benzbromarone
- ○ Commence long term low dose colchicine.
- ○ Commence long term oral steroids
- ○ Commence Probenecid
- ○ Commence Sulphinpyrazone

Commence Benzbromarone ✔ 38%

Correct answer selected

Commence long term low dose colchicine. 9%

Commence long term oral steroids 14%

Commence Probenecid 32%

Commence Sulphinpyrazone 7%

Recent guidance from the British Society of Rheumatology suggests that if a patient's gout is not adequately controlled on allopurinol and they have renal impairment then they should be switched to Benzbromarone. This drug needs to be carefully monitored as it is associated with liver function abnormalities.

A 51 year old lady presents with a septic right knee joint. Joint aspiration is sent for culture and Streptococcus bovis is confirmed. She is treated with intravenous antibiotics for 2 weeks and a further 4 weeks of oral antimicrobial therapy.

Which investigation should be carried out next?

- Arthroscopy
- Chest X Ray
- Colonoscopy
- Lumbar spine X rays
- Synovial biopsy

- Arthroscopy — 8%
- Chest X Ray — 2%
- Colonoscopy ✔ Correct answer selected — 84%
- Lumbar spine X rays — 3%
- Synovial biopsy — 3%

Steptococcus bovis is an organism that is associated with colonic malignancy. Genomic reassociations have shown that S. bovis biotype 1 is associated with malignancy in 100% of cases and biotype 2 only in 25%. In this case S. bovis has seeded into the joint to produce a septic arthritis. As it is uncommon to isolate S. bovis in a joint, further follow up with colonoscopy is advised.

A 50 year old housewife presents with a 3 month history of myalgia, fatigue, and 'aching all over'. She is a non- smoker and not taking any medications. On examination her BMI is 31 $kg/m^2$ and she has some weakness in shoulder abduction bilaterally with some difficulty in rising from a chair.

Investigations:

| | | |
|---|---|---|
| **Haemoglobin** | 12.9 g/dL | (13 - 18 g/dL) |
| **WBC** | 6.4 $x10^9/L$ | (4 -11 $x10^9/L$) |
| **Platelets** | 389 $x10^9/L$ | (150 - 400 $x10^9/L$) |
| **MCV** | 103 fl | (80-100 fl) |
| **ESR** | 10 mm/hr | (<40 mm/hr) |
| **CK** | 248 iU/L | (<200 iU/L) |
| **Bilirubin** | 10 iU/L | (3-17 iU/L) |
| **ALP** | 190 iU/L | (<300 iU/L) |
| **AST** | 46 iU/L | (3-35 iU/L) |
| **ALT** | 35 iU/L | (3-35 iU/L) |
| **LDH** | 300 iU/L | (70-250 iU/L) |
| **Total Cholesterol** | 6.1 iU/L | (<5 iU/L) |
| **Triglycerides** | 3.4 iU/L | (<1.9 iU/L) |

What is the most likely diagnosis?

- ○ Fibromyalgia
- ○ Hypothyroidism
- ○ Myasthenia gravis
- ○ Polymyalgia rheumatica
- ○ Polymyositis

Fibromyalgia 17%

Hypothyroidism ← Correct answer 41%

Myasthenia gravis 1%

Polymyalgia rheumatica 27%

Polymyositis ✖ Incorrect answer selected 14%

This patient has a lot of non specific symptoms which suggest a diagnosis of hypothyroidism. The myalgia, fatigue, a raised BMI that suggests weight gain, and mild proximal myopathy. The raised MCV, and hypertriglyceridaemia are associated features including mildly raised CK, AST, LDH due to abnormal muscle membranes.

Increased total and LDL cholesterol plus triglycerides may be seen due to reduced thyroid hormone metabolic clearance. Insulin resistance also occurs and raised plasma glucose/ abnormal glucose tolerance can be seen.

It is unlikely that such a mild CK rise would be associated with inflammatory myositis and fibromyalgia would not fit with the abnormal investigation pattern seen.

A 25 year old Romanian man who has just returned from a holiday to Romania, presents with a swollen right knee. He is otherwise well with no constitutional symptoms and no other joint symptoms.

The knee is aspirated and sent for microscopy and culture. The results are as follows;

| | |
|---|---|
| **Leucocytes** | 100,000 |
| **No growth** | |

What is the most likely diagnosis?

- ○ Ankylosing spondylitis
- ○ Reactive arthritis
- ○ Rheumatoid arthritis
- ○ Septic arthritis
- ○ Tuberculosis

| | | |
|---|---|---|
| Reactive arthritis ← Correct answer | | 60% |
| Rheumatoid arthritis | | 0% |
| Septic arthritis ✖ Incorrect answer selected | | 28% |
| Tuberculosis | | 12% |

This is most likely to be a reactive arthritis. A leucocyte count >50,000 means the effusion is likely to be inflammatory, but without other joint symptoms it is unlikely to be ankylosing spondylitis or rheumatoid arthritis. And without constitutional symptoms septic arthritis or TB are less likely. You would also expect a positive culture results as yields from synovial fluid are 85% and 80% respectively.

Reactive arthritis most commonly occurs after an enteric or urogenital infection. Chlamydia is the most common urogenital infection which causes reactive arthritis and is commonly asymptomatic. Enteric infections such as Shigella, Salmonella, and Yersinia are all associated with reactive arthritis. All are gram negative. Infections are more likely to cause reactive arthritis in HLA B27 positive individuals. The mean age of onset is 25-35 years. It commonly causes a lower limb mono- or oligoarthritis but may cause inflammatory back pain or dactylitis. Enthesitis may also occur. There is an association with keratoderma and pustulosis on the palms and soles, uveitis and conjunctivitis and, with urogenital infection, balanitis. ESR and CRP are raised but rheumatoid factor and ANA are negative.

Most will settle within 3-5 months and may be treated with analgesia and NSAIDs alone. 15% will be more aggressive and persistent and may require glucocorticoids initially and sometimes sulphasalazine, for which there is RCT evidence, or methotrexate, for which there is no RCT evidence. Antibiotics may be used if the causative organism is identified.

A 54 year old gentleman with renal impairment develops a third attack of gouty arthritis this year. He has been taking allopurinol for 2 years and at 300mg daily dosage for 9 months. He denies alcohol intake. There is a history of renal calculi previously with no identifiable cause and he has had removal of tophus from his left first metatarsophalangeal joint 3 years ago. There is no history of heart failure or diuretic use, but he is taking Losartan for hypertension.

Investigations:

| | | |
|---|---|---|
| **CRP** | 21 mg/L | (Normal < 10 mg/L) |
| **Uric acid** | 0.45 mmol/L | (Normal < 0.4 mmol/L) |
| **Urea** | 19 mmol/L | (Normal < 8.0 mmol/L) |
| **Creatinine** | 210 µmol/L | (Normal < 110 µmol/L) |
| **eGFR** | 35 ml/min | (Mild <90, Mod <60, severe < 30) |
| **Glucose** | 4.7 mmol/L | (Normal 3.5 - 5.0 mmol/L) |

Which treatment is most appropriate?

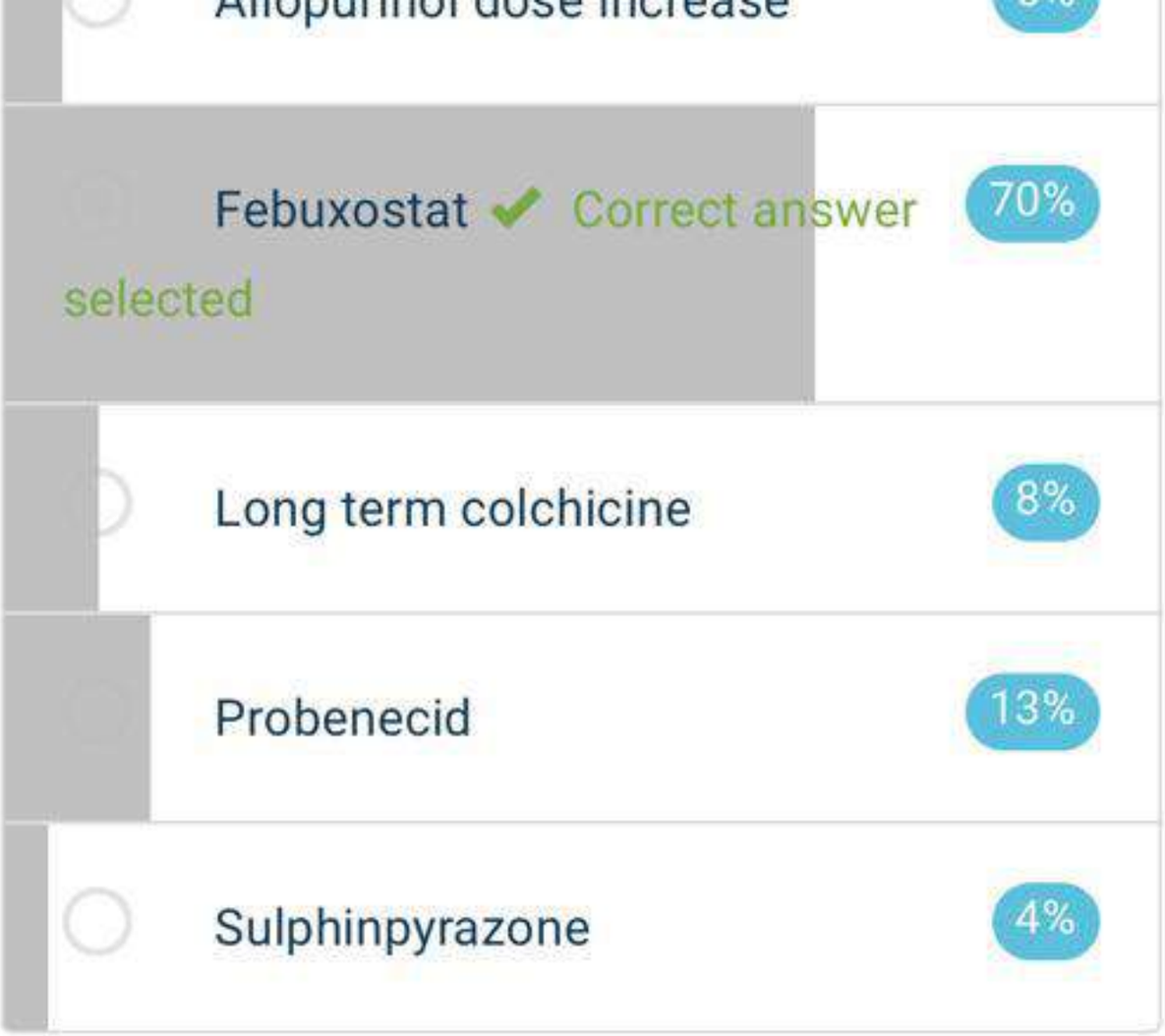
- ○ Allopurinol dose increase
- ○ Febuxostat
- ○ Long term colchicine
- ○ Probenecid
- ○ Sulphinpyrazone

# Synovial Fluid Analyses, Synovial Biopsy and Synovial Pathology

| | Appearance | Viscosity | Cells per mm³ | % PMNs | Crystals | Culture |
|---|---|---|---|---|---|---|
| Normal | Transparent | High | <200 | <10% | Negative | Negative |
| Osteoarthritis | Transparent | High | 200-2000 | <10% | Occasional calcium pyrophospate and hydroxyapatite crystals | Negative |
| Rheumatoid arthritis | Translucent | Low | 2000-50,000 | Variable | Negative | Negative |
| Psoriatic arthritis | Translucent | Low | 2000-50,000 | Variable | Negative | Negative |
| Reactive arthritis | Translucent | Low | 2000-50,000 | Variable | Negative | Negative |
| Gout | Translucent to cloudy | Low | 200->50,000 | >90% | Needle-shaped, negatively birefringent monosodium urate monohydrate crystals | Negative |
| Pseudogout | Translucent to cloudy | Low | 200-50,000 | >90% | Rhomboid, positively birefringent calcium pyrophosphate crystals | Negative |
| Bacterial arthritis | Cloudy | Variable | 2000->50,000 | >90% | Negative | Positive |
| PVNS | Hemorrhagic or brown | Low | — | — | Negative | Negative |
| Hemarthrosis | Hemorrhagic | Low | — | — | Negative | Negative |

PMNs, polymorphonuclear neutrophils; PVNS, pigmented villonodular synovitis.

| | Colour | Clarity | Viscosity | WBC count ($mm^3$) | Neutrophil count | Gram stain | Crystals |
|---|---|---|---|---|---|---|---|
| **Normal** | Colourless | Translucent | ↑ | < 200 cells/$mm^3$ | <25 % | Negative | Negative |
| **Non-inflammatory** | Straw like / yellow | Translucent | ↑ | 200 - 2000 cells/$mm^3$ | <25 % | Negative | Negative |
| **Inflammatory** | Yellow | Cloudy | ↓ | 2000–50,000 cells/$mm^3$ | >50 % | Negative | Positive |
| **Septic** | Yellow/green | Cloudy / opaque | ↓ | >50,000 cells/$mm^3$ | >75 % | Positive | Negative |
| **Haemarthrosis** | Red/ xanthochromic | Bloody | Variable | 200-2000 $mm^3$ | 50-75 % | Negative | Negative |




There is no dose adjustment required for febuxostat in mild- moderate renal impairment. It is relatively contraindicated in ischaemic heart disease and heart failure which this patient doesn't have. Allopurinol cant be increased due to very poor renal function.

Sulphinpyrazone and probenecid are not safe in renal impairment but benzbromarone is, though it is not one of the options given.

The BSR (British Society for Rheumatology ) permits colchicine to be given for a maximum of 6 months at 0.5 mg bd from the initiation of uricosuric therapy.

A 43 year old butcher is referred to you by her GP with malaise, worsening back pain and stiffness over the past 8 weeks. Every 2-3 days she has had undulating fevers, rigors and sweats at night. She received the BCG vaccination as an adolescent, and has never travelled to any areas endemic with tuberculosis. She denies sexual contact with anyone other than her husband, and has never used recreational drugs. She lives with her husband and two sons, who are all well.

Clinical examination reveals sacroiliac tenderness on the right on flexion and crossed adduction of the right hip. There is no tenderness of the left sacroiliac joint.

Her cervical lymph nodes are slightly enlarged but not tender.

Abdominal examination reveals splenomegaly.

Lumbar spine X ray: Narrowed disc space at L3/L4 disc.
L4 vertebral end plate destruction and bony sclerosis.

X ray Pelvis: normal sacroiliac joints

| | | |
|---|---|---|
| ESR | 90 | (<10mm/h) |

X ray Pelvis: normal sacroiliac joints

| | | |
|---|---|---|
| **ESR** | 90 | (<10mm/h) |
| **Hb** | 13.4 | (13-15g/dL) |
| **WBC** | 5.2 | (4-11x $10^9$ /L) |
| **PLT** | 320 | (150-400 x $10^9$ /L) |
| **MCV** | 84 | (80-100fL) |
| **Neutrophils** | 1.7 | (2-7.5 x $10^9$ /L) |
| **Lymphocytes** | 3.0 | (1.5-4.0 x $10^9$ /L) |
| **Eosinophils** | 0.1 | (0.04-0.4 x $10^9$ /L) |
| **Monocytes** | 0.4 | (0.2-0.8 x $10^9$ /L) |
| **Chest X Ray:** | normal. | |
| **Interferon Gamma Release Assay:** | Negative | |
| **Beta 2 microglobulin** | 1.5 | (1.5-2.1 g/mL) |
| **Lactate Dehydrogenase** | 240 | (240-280 U/L) |

Right Knee

| | |
|---|---|
| **Synovial Aspirate:** | Scanty small Gram negative organisms. |
| **Ziel Nielson Stain:** | Negative |

What is the most likely diagnosis?

- ○ Ankylosing Spondylitis
- ○ Brucellosis
- ○ Lymphoma
- ○ Psoriatic arthritis
- ○ Tuberculosis

Brucellosis is a zoonosis occurring after infection with any of the Brucella species, which include *B.mellitensis* (from sheep or goats), *B.abortus* (from cows), and *B.suis* (from pigs). Individuals at high risk of contracting the disease include farmers, veterinary surgeons, abbatoir workers and butchers.

The commonest species of Brucella to cause arthritis is *B.mellitensis*, and joint symptoms are seen in 80% of infections. These manifest mostly as spondylitis, and sacroiliitis in adults, and also arthralgia and peripheral arthritis. Axial involvement may be complicated by paraspinal abscess formation, myelopathy and radiculopathy.

Splenomegaly is seen in 25% of cases. Hepatomegaly and lymphadenopathy may also be seen. Brucella species are Gram negative organisms which mostly infect phagocytic mononuclear cells. The erythrocyte sedmientation rate is raised in most cases, and full blood count may reveal neutropenia and relative lymphocytosis in half of cases. There is no consensus on antimicrobial agents, but the World Health Organisation recommends rifampicin and doxycycline treatment for at least 6 weeks.

This lady's negative Interferon Gamma Release Assay, previous BCG vaccination and normal chest X ray makes tuberculosis less likely. As a butcher she may be at risk of exposure to bovine tuberculosis, but the presence of Gram negative, Ziel Nielsson stain negative organisms on her synovial fluid analysis should be more suggestive of Brucellosis amongst the possible diagnoses listed. Fevers and night sweats are not a feature of ankylosing spondylitis or psoriatic arthritis and should suggest an alternative diagnosis. Lymphoma is less likely given the normal LDH and beta 2 microglobulin levels.

A 74 year old man is referred urgently from his general practitioner with new onset arthropathy mainly affecting his hands. This had increased in severity over the last 2 months. His only medication prior to this event was omeprazole for occasional indigestion.

Examination revealed symmetrical synovitis of his wrists and proximal interphalangeal joints, he also had marked oedema of the dorsum of his hands and pitting oedema up to his knees. He has recently commenced frusemide for the oedema with no benefit.

Investigations reveal the following:

| | | |
|---|---|---|
| **Haemoglobin** | 10.8 g/dl | (13.5-17.7) |
| **Creatinine** | 95 umol/L | (50-100) |
| **ESR** | 105 mm/hr | (0-10) |
| **CRP** | 64 mg/dl | (<5) |
| **Thyroid function tests** | Normal | |
| **Albumin** | 35 g/L | (34-48) |
| **Total Protein** | 80 g/L | (65-80) |
| **Rheumatoid Factor** | Negative | |
| **ANA** | Negative | |
| **Uric Acid** | 370 umol/L | (110-420) |

The most appropriate initial management of this patient is:

- ○ Prednisolone 10 mg per day
- ○ Prednisolone 10 mg per day and Methotrexate
- ○ Prednisolone 40 mg per day
- ○ Prednisolone 40 mg per day and Methotrexate
- ○ Prednisolone 60 mg per day

Prednisolone 10 mg per day ← 14%

Correct answer

Prednisolone 10 mg per day and Methotrexate 15%

Prednisolone 40 mg per day 33%

Prednisolone 40 mg per day and Methotrexate 31%

Prednisolone 60 mg per day ✖ 8%

Incorrect answer selected

The case presented above is typical for the diagnosis of remitting seronegative symmetrical synovitis with pitting edema (RS3PE). This is an inflammatory condition of acute onset which presents with sudden onset polyarthritis associated with bilateral pitting oedema of both hands and lower limbs in older patients (usually men) and is rheumatoid factor negative. The main differentials for this condition are late onset Rheumatoid arthritis, polymyalgia rheumatica, crystal arthropathy and also paraneoplastic syndromes which have frequently been reported in association with this condition. A particular feature of RS3PE is that it is very sensitive to the introduction of low dose oral steroids at a dose of 10-15 mg. If there is a poor response to steroids with the typical features of the condition a paraneoplastic cause may need to be pursued.

A 66 year old lady with a 20 year history of seropositive erosive rheumatoid arthritis presents with a two week history of deteriorating weakness and neck pain. She has noticed neck pain and a sensation that her head is slumping forwards. Her arms and legs feel generally weak and she has complained of urinary hesitancy and constipation in the past week.

Clinical examination reveals painful restricted neck movements. Tone is increased in the upper and lower limbs. There is proximal weakness graded 4/5 on shoulder abduction and hip flexion bilaterally. Biceps and knee jerk reflexes are bilaterally brisk.

What is the most appropriate investigation?

- ○ Cerebrospinal Fluid analysis
- ○ Cervical spine X ray with flexion / extension views, and MRI cervical spine
- ○ MRI Brain
- ○ MRI lumbar spine
- ○ Nerve conduction studies / electromyography

Cerebrospinal Fluid analysis 1%

Cervical spine X ray with flexion / extension views, and MRI cervical spine 88% ✔
Correct answer selected

MRI Brain 4%

MRI lumbar spine 3%

Nerve conduction studies / electromyography 3%

Atlanto axial instability affects between 12 and 33% of patients with rheumatoid arthritis 1-3. Assessing the atlanto-axial joint requires cervical spine radiographs in flexion and extension in the first instance, followed by magnetic resonance imaging of the cervical portion of the spinal cord[4]. An urgent spinal and neurosurgical opinion should be sought.

Although a primary brain disorder such as sagittal sinus thrombosis, space occupying lesions or demyelination could be considered in the differential diagnosis, in a rheumatoid arthritis patient with neck pain, tetraplegia and upper motor neurone signs, atlantoaxial instability must be considered first. Imaging of the brain and lumbar puncture is therefore less relevant. Nerve conduction studies / electromyography would not be helpful, and imaging the lumbar spine would miss a higher central spinal cord lesion.

References

A 66 year old woman who has type 2 diabetes presents with a hot swollen knee. She also has cellulitis affecting the same leg distally. Aspiration of the knee is performed and culture of the fluid grows Staph Aureus. She is started on IV flucloxacillin and benzyl penicillin as per local protocol.

She is keen to go home. How long should you tell her she is likely to remain on antibiotics?

- IV antibiotics for 12 weeks
- IV antibiotics for 2 weeks followed by 4 weeks of oral antibiotics
- IV antibiotics for 4 weeks followed by 6 weeks of oral antibiotics
- IV antibiotics for 6 weeks
- IV antibiotics for 6 weeks followed by 4 weeks of oral antibiotics

IV antibiotics for 2 weeks followed by 4 weeks of oral antibiotics ✔ 79%

Correct answer selected

IV antibiotics for 4 weeks followed by 6 weeks of oral antibiotics 7%

IV antibiotics for 6 weeks 11%

IV antibiotics for 6 weeks followed by 4 weeks of oral antibiotics 2%

Although there is no strong evidence base empirically clinicians use a regime of 2 weeks of sensitive IV antibiotics followed by 4 weeks of oral antibiotics. This is obviously guided by the patients response to therapy and as well as clinical response, white cell count and CRP should be repeated to monitor the response to antibiotics. As she is diabetic she is at increased risk of infection in the first place. Other risk factors include;

1. Previous joint disease (including osteoarthritis)
2. Immunocompromise
3. Low socio-economic status
4. Intravenous drug abuse
5. Alcoholism
6. Cutaneous ulcers of any origin

C J Mathews, G Kingsley, M Field, A Jones, V C

A 24 year old lady is admitted under the acute medical team with sudden onset expressive dysphasia and right sided hemiplegia. She has suffered from migraine since the age of 16.

Clinical examination confirms increased tone in the right arm and leg. Power is graded 4/5 in all muscle groups of the right arm and leg and is 5/5 on the left. There is generalised hyper-reflexia and the right plantar is extensor. Sensation to light touch and vibration sense is preserved.

Investigations

CT Brain: Infarct in the left frontal lobe in the territory of the left middle cerebral artery.

| | | |
|---|---|---|
| **Anti dsDNA** | 5 U/L | (<20 U/L) |
| **ESR** | 32 mm/h | (0-10mm/h) |
| **CRP** | 39 mg/L | (<7mg/L) |
| **Lupus Anticoagulant** | Positive | |
| **Anti Cardiolipin IgG** | 45 GPLU/ml | (<10) |
| **Anti Cardiolipin** | 50 MPLU/ml | (<7) |

| | | |
|---|---|---|
| **Anti Cardiolipin IgM** | 50 MPLU/ml | (<7) |
| **Factor V Leiden mutation:** | Not detected. | |
| **Protein C activity** | 118% | (76-208%) |
| **Protein S activity** | 111% | (62-153%) |
| **Anti thrombin III** | 0.9 kIU/L | (0.8-1.2 kIU/L) |
| **Homocysteine** | 5.5micromol/L | (4.9-11.6micromol/L) |

ECG: sinus rhythm, 80 beats per minute, normal axis, normal morphology.

Which of the following is the next most appropriate investigation?

- ○ Anti Beta 2 Glycoprotein 1 Antibodies
- ○ Carotid and vertebral artery Doppler scan
- ○ Echocardiography
- ○ Lower limb Venous Doppler
- ○ MRI Brain

Carotid and vertebral artery Doppler scan 29%

Echocardiography ✔ Correct answer selected 25%

Lower limb Venous Doppler 4%

MRI Brain 16%

Antiphospholipid syndrome was first described by Hughes in 1983[1]. The most common cardiac manifestation of the disease is a non-bacterial thrombotic endocarditis[2], caused by platelet-fibrin thrombi forming on the endocardial surface of valves, with a prevalence of 11.6% reported[3]. An echocardiogram is an essential investigation for any patient presenting with a cerebral embolism to exclude an underlying cardiac cause such as mural thrombus, atrial myxoma, valvular vegetations, patent foramen ovale, and atrial or ventricular septal defects. Since her lupus anticoagulant and anti cardiolipin antibodies are both positive, testing for anti-beta2 glycoprotein1 antibodies would not provide any additional information at this stage. A repeat antiphospholipid screen in 12 weeks' time may be considered, but this is not relevant to this particular question. At her age she is unlikely to have significant atherosclerotic involvement of her carotid arteries to warrant a carotid arterial Doppler. If a paradoxical embolus was suspected, then an echocardiogram would be more urgently required than a venous Doppler scan of the leg. Her history does not suggest a cerebral vasculitis or encephalitis and therefore MRI would not take precedence over echocardiography in this case.

A 27 year old man is referred urgently by his general practitioner with right shoulder pain. He is on no medication but admits to using intravenous heroin on a regular basis. On examination, he is pyrexial ($38.1^0$C) and examination of the anterior chest wall reveals tenderness and swelling over the right sternoclavicular joint. He has no other joint abnormalities.

An ultrasound is performed which reveals a fluid collection around the sternoclavicular joint. This is aspirated and 2mls of turbid fluid is sent for analysis. He is commenced on broad spectrum antibiotics intravenously. The culture is positive 24 hours later.

Given his history which of the following is the most likely cause of his septic arthritis?

- Haemophilus influenzae
- Polymicrobial infection
- Pseudomonas aeruginosa
- Staphyloccocus aureus
- Streptococcus pneumoniae

| | | |
|---|---|---|
| ○ | Haemophilus influenzae | 1% |
| ○ | Polymicrobial infection | 2% |
| ○ | Pseudomonas aeruginosa | 5% |
| ✔ | Staphyloccocus aureus<br>Correct answer selected | 91% |
| ○ | Streptococcus pneumoniae | 2% |

Infection of the sternoclavicular joint is rare but represents 17% of joint infections in IV drug users versus 1% in the general population. Pseudomonas aeruginosa joint infection is considered to be more common in IV drug users but Staphylococcus aureus infection still remains the most common infective agent based on a recent review of 180 cases[1]. Despite this it may be important to cover both staphylococcal and pseudomonas infection until culture results are available in this patient.

Reference:

1. Ross JJ, Shamsuddin H. Sternoclavicular

A 78 year old lady with rheumatoid arthritis and type 2 diabetes mellitus presents with a chesty productive cough. Her medications include Metformin 1g bd, Methotrexate 15mg weekly, Folic acid 5 mg daily, and Prednisolone 5mg od. She is treated at home for a chest infection with a one week course of amoxycillin and makes a good recovery. Six weeks later she presents with severe lower lumbar back pain and is noted to have a temperature of 37C, a pulse of 100 bpm and a blood pressure of 138/78 mmHg. She is noted to have a left foot drop and a rash over the left shin which is waxy brown-yellow in colour.

Her investigations reveal:

| | | |
|---|---|---|
| **Haemoglobin** | 12.9 g/dL | (13 - 18 g/dL) |
| **WBC** | 15.3 $x10^9$/L | (4 -11 $x10^9$/L) |
| **Neutrophils** | 12.1 x $10^9$/L | (2 - 8 $x10^9$/L) |
| **Platelets** | 514 $x10^9$/L | (150 - 400 $x10^9$/L) |
| **CRP** | 53 mg/L | (< 10 mg/L) |
| **ESR** | 74 mm/hr | (< 40 mm/hr) |
| **Ig M** | 2.4 g/L | (0.4 -2.3 g/L) |
| **Ig A** | 7.8 g/L | (0.6 -5.0 g/L) |
| **Ig G** | 12.1 g/L | (6.0 - 15.6 g/L) |

Serum Electrophoresis - increased alpha and beta globulins, no paraprotein detected.

Serum Electrophoresis - increased alpha and beta globulins, no paraprotein detected.
Urine electrophoresis - Bence jones protein not detected

Lumbar spine X ray - Mild degenerative lumbar spondylotic changes.
Chest X Ray - Clear lung fields.

Which of the following is the most likely diagnosis?

- Infective discitis
- Lumbar spondylosis
- Multiple myeloma
- Osteoporotic fracture
- Rheumatoid vasculitis

Peer responses

| | | |
|---|---|---|
| Infective discitis ✔ Correct answer selected | | 55% |
| ○ | Lumbar spondylosis | 1% |
| ○ | Multiple myeloma | 3% |
| ○ | Osteoporotic fracture | 2% |
| | Rheumatoid vasculitis | 39% |

This lady has risk factors for infection - Type 2 Diabetes Mellitus and immunosuppression with methotrexate for rheumatoid arthritis. Probable haematogenous spread of infection after the recent chest infection, seems the most probable cause of the presentation, resulting in seeding of the infection at the lumbar intervertebral disc. She has nerve root signs at L4/5 with weak tibialis anterior affecting ankle dorsiflexion. Incidentally, the rash is the description of necrobiosis lipoidica diabeticorum, and not erythema nodosum or a vasculitis rash. Less than 50% of infective discitis patients have fever. Urgent MRI imaging is first choice here. CT guided biopsy can help to identify an organism if blood cultures remain negative, but only in 50% of cases. Staph. aureus and coagulase negative Staphylococci are the most common organisms. Tuberculosis should always be considered on the list of differential diagnoses in the immunosuppressed patient. The waxy-brown rash on the shin is a red herring and in this patient with diabetes suggests necrobiosis lipoidica diabeticorum.

A 43 year old man is admitted under the general medical intake with generalised progressive weakness of his arms and legs. During the preceding 5 days he complained of flu like symptoms and muscle aches. There is no change in his symptoms after exercise such as walking up a flight of stairs. He compares the discomfort in his legs to a "swarm of bees crawling over his thighs". He has noticed difficulty in swallowing but no nasal regurgitation of liquids. His speech and facial expression remain unchanged. There is no family history of muscle disorders.

On examination he displays marked truncal weakness and has difficulty even to sit upright. He has difficulty holding his head up. The muscle bulk of his arms and legs appear normal with no wasting or hypertrophy. There is no fasciculation of the muscles. His limb tone is reduced, and power graded 3/5 on hip flexion and shoulder abduction. Cranial nerve examination is normal. Respiratory examination is unremarkable.

| | | |
|---|---|---|
| **CK** | 13,000 U/L | (30-200 U/L) |
| **CRP** | 120mg/L | (<5mg/L) |
| **ESR** | 87 mm/h | (<10mm/h) |

Urine dipstick: No abnormality detected

Urine dipstick: No abnormality detected.

Urine myoglobin: Not detected.

| | | |
|---|---|---|
| **Sodium** | 135 mmol/L | (135-145) |
| **Potassium** | 4.3 mmol/L | (3.5-5.0) |
| **Urea** | 5.9 mmol/L | (2.5-7.0) |
| **Creatinine** | 105 micromol/L | (70-110) |
| **25OHVit D** | 52 ng/L | (desirable levels > 30ng/L) |
| **Free T4** | 20.8 pmol/l | (9.8 - 23.8) |
| **TSH** | 2.2 mu/l | (0.5-4.5) |

Electromyography is reported as:

Myopathic potentials: low amplitude, short duration polyphasic units on voluntary activation. Increased spontaneous activity with fibrillations and complex repetitive discharges.

Which is the most likely diagnosis?

- ○ Limb-girdle muscular dystrophy
- ○ McArdle's syndrome
- ○ Motor neurone disease
- ○ Polymyositis
- ○ Rhabdomyolysis

Polymyositis ✔ Correct answer 56%

selected

Rhabdomyolysis 2%

Although there is a tendency to overdiagnose polymyositis, this is the most likely diagnosis of the options listed. The presence of symmetrical proximal muscle weakness, dysphagia, elevated CK, and myopathic EMG findings are highly suggestive of polymyositis. Alanine (ALT) and aspartate (AST) transaminases are often raised in polymyositis. A muscle biopsy would be needed to confirm the diagnosis. It is important to determine this patient's autoantibody status, particularly with regard to anti-tRNA synthetase antibodies- which are positive in 30% of polymyositis patients (also known as Anti-Jo1 antibodies) - since this is associated with interstitial lung disease, Raynaud's phenomenon, "mechanic's hands" (manifest as roughened cracked skin of the fingers), and arthritis. The presence of anti-synthetase antibodies carries a poorer prognosis[1].

Myoglobinuric acute renal failure has been reported in polymyositis, but is rare[2]. The absence of fasciculation and bulbar symptoms, and myopathic EMG findings makes motor neurone disease unlikely. Limb-girdle dystrophy is typically characterised by marked hypertrophy of the calves, but with gross muscle weakness. This gentleman's muscle bulk appears normal, making limb girdle dystrophy unlikely. McArdle's syndrome is characterised by a "second wind phenomenon" where patients experience weakness on exercise, but then following a brief period of rest the muscle power returns significantly better than before. During exacerbations of McArdle's disease patients may be at risk of rhabdomyolysis. His

A 45 year old plumber is admitted to the acute medical ward with generalised arthralgia and an inflamed left eye confirmed as uveitis by the ophthalmologists. Examination reveals bilateral parotid swelling and an effusion of the left knee and synovitis of both wrists.

Initial investigations demonstrate:

| | |
|---|---|
| **Haemoglobin** | 12.9 g/dl (13.5-17.7) |
| **Creatinine** | 75 umol/L (50-100) |
| **ESR** | 65 mm/hr (0-10) |
| **CRP** | 43 mg/dl (<5) |
| **ANA** | Negative |
| **Rheumatoid Factor** | Negative |
| **Serum ACE level** | 40 IU/L (8-52) |

2 days after admission the patient is reviewed on the ward round and noted to have developed a left sided seventh cranial nerve palsy.

What is the most likely diagnosis?

- ○ Chronic granulomatous disease
- ○ Lyme Disease
- ○ Reactive arthritis
- ○ Sarcoidosis
- ○ Sjörgren's Syndrome

Ufone 12:16 PM 31%
studyprn.com



| | | |
|---|---|---|
| | Lyme Disease | 36% |
| | Reactive arthritis | 6% |
| selected | Sarcoidosis ✔ Correct answer | 35% |
| | Sjörgren's Syndrome | 16% |

The combination of uveitis, parotiditis and a facial nerve palsy (Heerfordt's syndrome) is highly suggestive of sarcoidosis. The normal serum ACE in this man should not exclude the diagnosis of Sacroidosis and even if elevated is not diagnostic. The other diseases listed may share many of the features of sarcoidosis particularly Sjörgren's Syndrome. Chronic granulomatous disease is a primary immune deficiency syndrome which usually presents early in life with recurrent infections but an X-linked form of the disease can present in adulthood.

A 55 year old man is seen on the acute medical ward with a month long history of fever, myalgia, arthralgia and abdominal discomfort. Examination reveals no synovitis but diffuse abdominal tenderness and a few scattered subcutaneous nodules. Urine dipstick is positive for blood and protein. Initial investigations are as follows:

| | | |
|---|---|---|
| **CRP** | 95 mg/dl | (<5) |
| **ESR** | 72 mm/hr | (0-10) |
| **WBC** | 13 x$10^9$/l | (4-11) |
| **Creatinine** | 135 umol/L | (50-100) |
| **ANA** | Negative | |

Which of the following is most likely to confirm the diagnosis in this patient?

- ANCA
- Renal and coeliac Angiography
- CT abdomen and pelvis
- Skin biopsy
- USS abdomen

ANCA 19%

Renal and coeliac Angiography 25%

✔ Correct answer selected

CT abdomen and pelvis 15%

Skin biopsy 41%

USS abdomen 1%

This patient presents with non specific features but diffuse abdominal pain and a positive urine dipstick with mild renal impairment. Although all the above investigations may be required to rule out other causes for these symptoms the main differential in this man is between Polyarteritis Nodosa (PAN) and Microscopic polyangiitis (MP). Although p-ANCA is usually positive in MP this is not always the case however the findings of aneuryms, segmental arterial narrowing and pruning of the peripheral vascular tree is seen in PAN but not MP making this the most likely test to confirm the diagnosis.

PAN is now divided into classical PAN and that associated with Hepatitis B infection. This distinction is important as management is different with Hepatitis B associated PAN being treated with antiviral agents and plasma exchange in addition to steroids in the first instance. Cyclophosphamide and steroid induction therapy remains the mainstay of treatment for non-Hepatitis B associated PAN.

A 69 year old woman is being seen in the rheumatology clinic for a number of months with a polyarthralgia and mild weight loss. Her GP has requested admission as she has lost a further stone in the last month and is suffering with fevers and a cough productive of rusty sputum. Her investigations are as follows;

| | | |
|---|---|---|
| **Haemoglobin** | 9.7 g/dl | (13.5-17.7 g/dl) |
| **MCV** | 68 fl | (83-98 fl) |
| **WCC** | 14.8x$10^9$/l | (4-11 x$10^9$/l) |
| **Neutrophils** | 8.9x$10^9$/l | (2.0-7.5 x$10^9$/l) |
| **Lymphocytes** | 4.2 x$10^9$/l | (1.5-4.0 x$10^9$/l) |
| **Eosinophils** | 0.7 x $10^9$/l | (0.04-0.4 x$10^9$/l) |
| **Platelets** | 428 x$10^9$/l | (150-400 x$10^9$/l) |
| **Creatinine** | 122 ?mol/l | (79-110? mol/l) |
| **RF** | negative | |
| **ANA** | positive 1:160 | |

| | |
|---|---|
| **RF** | negative |
| **ANA** | positive 1:160 |
| **ENA** | negative |
| **ANCA** | 1:1280 MPO positive |
| **C3/C4** | normal |

Chest x-ray shows diffuse patchy shadowing at both bases.

You arrange pulmonary function tests.

Which of the following are Pulmonary Function Tests most likely to show?

- ○ A reduced transfer factor
- ○ An increased transfer factor
- ○ An increased FVC
- ○ A reduced FEV1/FVC
- ○ A reduced FVC

Which of the following are Pulmonary Function Tests most likely to show?

Peer responses

| | |
|---|---|
| A reduced transfer factor | 27% |
| An increased transfer factor ✔ Correct answer selected | 45% |
| An increased FVC | 5% |
| A reduced FEV1/FVC | 7% |
| A reduced FVC | 17% |

This lady is likely to have developed a degree of alveolar haemorrhage secondary to her ANCA positive vasculitis. Although over time recurrent alveolar haemorrhage can lead to fibrosis and a reduced transfer factor, acutely the presence of haemoglobin in the airways increases the DLCO.

Reference:

Kumar and Clark.Clinical medicine 7th edition. Saunders limited 2009.

A 74 year old lady presents with a history of gradual weakness in her legs to an extent that she can no longer walk. She complains of back pains and numbness down both legs leading up to this presentation. There is no history of urinary or faecal incontinence. She has no significant past medical history except for previous carpal tunnel syndrome release and cervical spondylosis. On examination you find that there is full power in her upper limbs with intact reflexes and sensation. The legs are weak with absent knee and ankle jerks. There is loss of sensation to pinprick at the big toes of both feet, soles, and the back of both legs. There is perianal numbness and reduced sphincter tone.

What is the next appropriate investigation?

- Isotope bone scan
- MRI Cervical spine
- MRI Lumbar spine
- Nerve conduction studies
- Xray lumbar spine

MRI Lumbar spine ✔ Correct answer selected 94%

Nerve conduction studies 3%

Xray lumbar spine 2%

This lady has the classic features of a cauda equina syndrome:

- Back pain
- Radicular pain/numbness down the legs
- Areflexic paralysis of the legs
- Sensory loss in a root distribution
- Reduced sphincter power

She has bilateral lower leg flaccid weakness with absent reflexes and sensory disturbance with loss of perianal sensation. Usually these lesions present at an earlier stage with conus medullaris lesions: urinary retention , constipation , back pain, sacral sensory loss, with or without leg weakness, & saddle anaesthesia. Previous cervical spondylosis and carpal tunnel syndrome release are just distractors and bear no clinical relevance to the current symptoms.

A 71 year old lady with a 10 year history of type 2 diabetes presents to accident and emergency with severe intermittent right sided abdominal pains. There is a long history of arthralgia over many years together with fatigue and Raynaud's phenomenon. Her only medications include Metformin 1g bd and furosemide 40mg for mild heart failure. Examination confirms a respiratory rate of 20 breaths per minute, pulse of 90 beats per minute, blood pressure of 110/78 mmHg and there is abdominal tenderness over the right flank.

Investigations:

| | | |
|---|---|---|
| **Rheumatoid factor** | 115 iU/L | (Normal < 15 iU/L) |
| **ANA** | 1: 2560 | (strongly positive > 1: 640) |
| **ENA** | strongly positive | |
| **SSA/ Ro** | 114 U/ml | (Normal < 20 U/ml) |
| **SSB/ La** | 64 U/ml | (Normal < 20 U/ml) |
| **ESR** | 78 mm/hr | ( Normal < 40 mm) |

| | | |
|---|---|---|
| | | U/ml) |
| **ESR** | 78 mm/hr | ( Normal < 40 mm) |
| **Glucose** | 7.0 mmol/L | (3.5 - 5.0 mmol/L) |
| **Urea** | 9.0 mmol/L | (< 8.0 mmol/l) |
| **Creatinine** | 70 µmol/L | (< 110 µmol/L) |
| **Sodium** | 135 mmol/L | (135-145 mmol/L) |
| **Potassium** | 3.0 mmol/L | (3.5 - 5.0 mmol/L) |
| **Chloride** | 99 mmol/L | (98-106 mmol/L) |
| **Bicarbonate** | 19 mmol/L | (24-30 mmol/L) |

Urine dipstick : Blood 3+, ph 5.8, glucose 1+

Chest X Ray- Clear

What is the most likely diagnosis?

- ○ Addisonian crisis
- ○ Diabetic ketoacidosis and cheiroarthropathy
- ○ Drug induced hypokalaemic acidosis
- ○ Sjogrens syndrome with distal renal tubular acidosis and nephrocalcinosis
- ○ Sjogrens syndrome/ Systemic lupus overlap

Sjogrens syndrome with distal renal tubular acidosis and nephrocalcinosis 71%

✔ Correct answer selected

Sjogrens syndrome/ Systemic lupus overlap 28%

This patient has symptoms and signs suggesting renal colic. Nephrocalcinosis is a recognised feature of hypercalciuria. The distal renal tubules are deficient in excreting H+ ions from the distal tubules. Hypokalaemia may also present as muscle weakness / hypokalaemic paralysis.

The anion gap is $(Na^+ + K^+)$- $(Cl^- + HCO^{3-})$ = (135 +3 ) - (99 +19)= 20 This explains the apparent breathessness - compensatory respiratory alkalosis in response to metabolic acidosis.

The positive RF , SSA/ Ro, SSB/ La are seen in Sjogrens and clinical symptoms may be longstanding prior to presentation. Marked polyclonal rise in IgG is also seen in active Sjogren's syndrome.

Metformin can cause lactic acidosis and furosemide may cause hypokalaemia but urine dipstick findings would not be compatible. One expects hyperkalaemia in an Addisonian crisis. There are no ketones in the urine dipstick therefore excluding diabetic ketoacidosis. Diabetic cheiroartropathy is more common in type 1 diabetics who complain of painless loss of function in the hands after swelling of MCP/PIPJs with development of thick tight waxy skin.

A 74 year old woman presents to clinic with a number of Leg ulcers. She has longstanding rheumatoid arthritis and had stopped her Methotrexate therapy over one year ago. Her weight has been stable. She is not keen on further therapy but is frustrated that she has had 6 months of troublesome leg ulcers. Abdominal examination reveals an 8cm mass in the left upper quadrant that is dull to percuss and descends on inspiration.

Her investigations are below:

| | | |
|---|---|---|
| **Haemoglobin** | 10.9 g/dL | (13 - 18 g/dL) |
| **WBC** | 2.4 $x10^9$/L | (4 -11 $x10^9$/L) |
| **Neutrophils** | 0.7 $x10^9$/L | (>2 $x10^9$/L) |
| **Lymphocytes** | 1.5 $x10^9$/L | (>1 $x10^9$/L) |
| **Platelets** | 85 $x10^9$/L | (150 - 400 $x10^9$/L) |

What is the most likely explanation for her symptoms?

- ○ Chronic lymphocytic leukaemia
- ○ Felty's syndrome
- ○ Methotrexate induced pancytopenia
- ○ Myelofibrosis
- ○ Occult Malignancy

Chronic lymphocytic leukaemia

Felty's syndrome ✔ Correct answer selected — 88%

Methotrexate induced pancytopenia — 2%

Myelofibrosis — 8%

Occult Malignancy — 1%

This long standing patient with rheumatoid arthritis has the triad of Neutropenia, Splenomegaly and leg ulcers. This is Felty's syndrome. Patients may also have other haematological findings including thrombocytopenia, anaemia and pancytopenia. Methotrexate induced pancytopenia would not occur a year after stopping therapy.

Felty's syndrome ties in all the features of this presentation, and the other diagnoses would not account for all these features.

References:

Oxford desk reference in Rheumatology, Watts et

A 78 year old man with gout, hypertension and renal impairment is admitted to the acute medical ward with increasing proximal muscle weakness over the last 4 weeks. His current medication is allopurinol 200mg per day, colchicine 500 mcg twice daily, atenolol 50mg and enalapril 10mg. Examination reveals MRC grade 4/5 power in the proximal muscle groups of both upper and lower limbs and small gouty tophi on both elbows.

Investigations reveal the following:

| | |
|---|---|
| **Creatinine** | 135 umol/L (50-100) |
| **Creatine Kinase(CK)** | 982 U/L (24-195) |
| **CRP** | 6 mg/dl (<5) |
| **ANA** | Negative |
| **Anti-Jo1** | Negative |
| **ESR** | 28 mm/hr (0-10) |

EMGs - Myopathic changes of proximal muscle groups

What is the most likely diagnosis?

- ○ Anti-synthetase syndrome
- ○ Colchicine induced myopathy
- ○ Guillain-Barré syndrome
- ○ Inclusion body myositis
- ○ Polymyositis

| | | |
|---|---|---|
| ○ | Anti-synthetase syndrome | 5% |
| ✔ | Colchicine induced myopathy<br>Correct answer selected | 49% |
| ○ | Guillain-Barré syndrome | 1% |
| | Inclusion body myositis | 19% |
| | Polymyositis | 26% |

Colchicine myopathy is characterized by proximal weakness and elevation of creatine kinase, proximal myopathic changes on electromyography and axonal polyneuropathy on nerve conduction studies. It is characteristically seen in patients with renal impairment but has rarely been described in patients with normal renal function. Muscle biopsy demonstrates vacuolar myopathy and would be the next investigation of choice in this patient. Treatment consists of drug withdrawal and it may take some months for muscle power to return and the CK to normalize.

A 28 year old female who is a solicitor presents with chest pain which is worse on inspiration and on lying flat. She has suffered with fatigue and arthralgia for some time. She has frequent mouth ulcers and suffers with a dry mouth. Recently she has had discomfort swallowing.

On examination she is mildly tachycardic and has an audible rub at the left lower sternal edge. Her hands are puffy and there is discolouration of the fingers. The joints of the hands are tender.

Investigations are as follows:

| | | |
|---|---|---|
| **CRP** | 88 mg/dl | (<10) |
| **ESR** | 102 mm/hr | (0-10) |
| **Hb** | 10.8 g/dl | (11.5-16.5) |
| **WCC** | $3.2x10^9$/l | (4-11) |
| **Neutrophils** | $2.1x10^9$/l | (2.0-7.5) |
| **Lymphocytes** | $0.6x10^9$/l | ( 1.5-4.0) |
| **Platelets** | $102x10^9$/l | (150-400) |
| **IgG** | 5.4 mg/l | (5.5-16.5) |
| **IgA** | 3.2 mg/l | (0.8-4.0) |

| | | |
|---|---|---|
| **Platelets** | 102x$10^9$/l | (150-400) |
| **IgG** | 5.4 mg/l | (5.5-16.5) |
| **IgA** | 3.2 mg/l | (0.8-4.0) |
| **IgM** | 1.2 mg/l | (0.4-2.0) |
| **Rheumatoid Factor** | 25 iu/l | (<20) |
| **ANA** | 1:1600 (positive) | |
| **ENA** | negative | |
| **ANCA** | negative | |

ECG; concave upward ST elevation in V2-6.

Chest x-ray; normal cardiac outline with small pleural effusion at left base.

Echocardiography; Small pericardial effusion. No evidence of tamponade.

What is the most likely diagnosis?

- ○ Rheumatoid arthritis
- ○ Sjogren's syndrome
- ○ Systemic lupus erythematosis
- ○ Takayasu's arteritis
- ○ Wegener's granulomatosis

| | |
|---|---|
| Rheumatoid arthritis | 8% |
| Sjogren's syndrome | 20% |
| Systemic lupus erythematosis<br>✔ Correct answer selected | 70% |
| Takayasu's arteritis | 2% |
| Wegener's granulomatosis | 0% |

Pericarditis may occur in many rheumatological conditions but most commonly in SLE, rheumatoid arthritis and systemic sclerosis. It is not usually seen in ANCA positive or large vessel vasculitis. It may be the presenting symptom in SLE but tends to present later in rheumatoid and without the typical ECG findings (including diffuse concave upward, saddle shaped, ST elevation, except in aVR and V1 where it is usually depressed. T waves are upright in the leads with ST elevation, and the PR segment deviates opposite to P-wave polarity).

Echocardiography is the imaging modality of choice as it is widely available at the bedside. Patients should be seen by a cardiologist. NSAIDs are often useful for analgesia. Glucocorticoids are also helpful both for pericarditis symptoms and to treat the underlying disease. For recurrent and large effusions fenestration or resection of the pericardium may be required.

The CRP is usually normal in SLE except when there is co-existant serositis or infection.

You are asked to see a 72 year old man on the urology ward who has developed a polyarthritis affecting his right knee, ankles, and wrists. He had his 3rd treatment with intravesical BCG chemotherapy for a transitional cell carcinoma of the bladder 5 days earlier.

On examination, his temperature is 38.1°C, he has a warm effusion at his right knee with movement limited to 40 degrees of flexion, he is unable to fully extend His ankles and wrists are tender but not swollen and movement is normal. He has no lymphadenopathy and the rest of his examination is unremarkable.

Investigations reveal:

| | | |
|---|---|---|
| **Hb** | 11.2 g/dl | (13.5-17.7g/dl) |
| **WBC** | 14.1 $x10^9$/l | (4-11 $x10^9$/l) |
| **Neutrophils** | 8.4 $x10^9$/l | (2.0-7.5 $x10^9$/l) |
| **Lymphoctytes** | 5.2 $x10^9$/l | (1.5-4.0 $x10^9$/l) |
| **Platelets** | 440 $x10^9$/l | (150-400 $x10^9$/l) |
| **ESR** | 90 mm/hr | (0-10 mm/hr) |
| **CRP** | 158 mg/dl | (<5 mg/dl) |
| **Creatinine** | 132?mol/l | (79-110?mol/l) |

A CT brain demonstrates a hypointensity in the high frontal region in keeping with an acute ischemic stroke. There is no intracranial haemorrhage. A CT angiogram (from the aortic arch) found a narrowed eccentric lumen of the right ICA with a crescent-shaped mural thrombus, findings consistent with a right internal carotid artery dissection. There is no evidence of intra- or extracranial aneurysms.

What is the most appropriate management for this patient?

- ○ Antiplatelets or anticoagulation for 3-6 months
- ○ Lifelong antiplatelets (aspirin 300mg for two weeks followed by clopidogrel 75 mg)
- ○ Thrombolysis treatment as per local protocol
- ○ Urgent carotid endarterectomy
- ○ Urgent stenting of right internal carotid artery

| | |
|---|---|
| Diabetes and endocrine medicine | 29 |
| Gastroenterology and hepatology | 49 |
| Infectious diseases | 22 |
| Medicine in the elderly | 16 |
| Musculoskeletal system | 29 |
| Neurology and ophthalmology | 39 |
| Renal medicine | 19 |
| Respiratory medicine | 28 |
| Other | 23 |
| **Total:** | **285** |

Ufone 3:25 PM 15%
studyprn.com

A 48-year-old gentleman presents to the Emergency department with left sided weakness, blurred vision and neck pain for the last 2 days. The left sided weakness was of a sudden onset immediately preceded by right sided neck pain. Further history reveals that he had a minor car accident incurring a whiplash injury two weeks ago. Usually he is fit and well with no vascular risk factors. A family history is unremarkable.

Neurological examination shows a right sided ptosis with a right pupil 3 mm in diameter, and left pupil 5 mm in diameter. There were no other cranial nerve deficits. The left side was minimally weak (4/5); and there are no other neurological deficits. Body temperature is 36.4°C; RR 18; blood pressure 128/81; HR 78; oxygen saturation (room air) 98%.

Blood tests:

| Test | Result | Normal range |
|---|---|---|
| Wbc | $8.2\times 10^9$/L | 4.5 to 11.0 $\times 10^9$/L |
| CRP | 4 mg/L | <8 mg/L |

A CT brain demonstrates a hypointensity in the high frontal region in keeping with an acute ischemic stroke. There is no intracranial

Aspirate joint and send for gram-stain, microscopy and culture ✔ Correct answer selected — 66%

Chest x-ray — 4%

Mantoux test — 1%

Treatment by instillation of an attenuated mycobacterium bovis into the bladder is common in superficial transitional cell bladder cancers. Following this a non-infectious polyarthritis may occur in 0.5-1% of patients. Knees are most commonly affected followed by ankles and wrists. Oligo and monoarthritis can also occur. Rarely sacroilitis, dactylitis, conjunctivitis, and uveitis can occur. Joint aspirates do not grow mycobacterium. The exact mechanism is unclear but it is thought that it is a T-cell mediated immune response to repeated antigen stimulation. It tends to occur after several instillations (mean 5). Pyrexia occurs in 2/3 of patients and most will mount raised inflammatory markers. Most are NSAID responsive but if there is no improvement rifampicin and isoniazid treatment may be effective. Infectious arthritis occurs much less frequently. A recent review found 8 cases, 1 had a monoarthritis of the knee; 2 had infection of a joint prosthesis, knee, and hip, respectively; and 5 had discitis. Infection of other organs (lungs, liver, and urinary tract) is more common. Joint infection tends to present and be diagnosed later than non-infectious cases, 8 months vs. 9 days on average. Patients also tend to be more systemically unwell.

| | | |
|---|---|---|
| **Platelets** | 440 x$10^9$/l | (150-400 x$10^9$/l) |
| **ESR** | 90 mm/hr | (0-10 mm/hr) |
| **CRP** | 158 mg/dl | (<5 mg/dl) |
| **Creatinine** | 132?mol/l | (79-110?mol/l) |
| **Urea** | 7.5 mmol/l | (2.5-6.7 mmol/l) |
| **ALT** | 26 u/l | (5-40 u/l) |
| **ALP** | 134 u/l | (39-117 u/l) |

Which of the following investigations would you initially request?

- ○ Aspirate joint and send for AFB
- ○ Aspirate joint and send for crystal analysis
- ○ Aspirate joint and send for gram-stain, microscopy and culture
- ○ Chest x-ray
- ○ Mantoux test

Antiplatelets or anticoagulation for 3-6 months ✔ Correct answer selected — 23%

Lifelong antiplatelets (aspirin 300mg for two weeks followed by clopidogrel 75 mg) — 23%

Thrombolysis treatment as per local protocol — 4%

Urgent carotid endarterectomy — 16%

Urgent stenting of right internal carotid artery — 35%

The CADISS trial published in 2015 found no difference in efficacy between antiplatelet and anticoagulant drugs at preventing stroke and death in patients with symptomatic carotid and vertebral artery dissection. The treatment duration is usually for 3-6 months with vascular imaging to monitor resolution of the dissection. Vascular interventions are usually reserved for patients with recurrent symptoms.

A 67 year old woman was admitted with a 3 day history of diplopia and clumsiness. She had been feeling unwell a week previously with a fever and flu-like illness and the symptoms of double vision and difficulty walking had developed over the last 3 days. She had a background history of hypothyroidism for which she took thyroxine and also had a 3 year history of type 2 diabetes for which she took metformin 1g bd.

On examination, she was orientated, had a temperature of 37C and a blood pressure of 142/82 mmHg with a pulse of 80bpm reg. She had weakness of abduction and adduction of the eyes with dilated and unreactive pupils together with bilateral facial weakness of the upper and lower face. There was also ataxia with difficulty standing upright and impaired finger to nose testing. Deep tendon reflexes were impaired though muscle strength was normal and there was no impairment of sensation.

Which of the following is the likely diagnosis?

- Guillain-Barre Syndrome
- Hashimoto's encephalopathy
- Lyme Disease
- Miller Fisher syndrome
- Neurosarcoidosis

Guillain-Barre Syndrome 10%

Hashimoto's encephalopathy 9%

Lyme Disease 2%

Miller Fisher syndrome ✔ 74%

Correct answer selected

Neurosarcoidosis 5%

This patient has a previous flu-like illness and has developed diplopia, facial weakness and ataxia. The diagnosis based on the history and examination is likely to be Miller Fisher syndrome a variant of Guillain Barre. Miller-Fisher is associated with the three features of: ataxia, ophthalmoplegia and loss of tendon reflexes. Diagnosis is based on the typical history and examination and is supported by acellular CSF with protein elevation.

A 22 year old woman has been treated by the dental surgeons for a tooth extraction and receives ondansetron for nausea. You are called acutely as she has developed rhythmical and uncontrollable movements of the arms and legs. On review, you find that she is alert and cooperative but is anxious and upset. She usually takes mirtazapine for insomnia but is otherwise well. She is distressed by these uncontrollable movements of the limbs.

On examination, her temperature is 37.3C, her blood pressure is 138/80 mmHg and her pulse is 100 bpm. She has rhythmical writhing movements of the arms and legs to a lesser extent and some facial movements. Otherwise, reflexes are normal and there is no focal neurology.

Which of the following is the most appropriate treatment for this patient?

- ○ Benztropine
- ○ Chlordiazepoxide
- ○ Chlorpromazine
- ○ Clonazepam
- ○ No treatment required

| | |
|---|---|
| Benztropine ✔ Correct answer selected | 59% |
| Chlordiazepoxide | 5% |
| Chlorpromazine | 11% |
| Clonazepam | 12% |
| No treatment required | 14% |

This patient has developed an acute dystonic reaction which is likely to have been precipitated by the ondansetron. Whilst acute dystonia is most often precipitated by dopamine antagonists such as metoclopramide and prochlorperazine, reports are associated with ondansetron. The differential diagnosis includes serotonin syndrome, but this is associated with high fever, anxiety, hyperreflexia and tachycardia. The treatment of serotonin syndrome is a dopamine antagonist, like chlorpromazine, but this may well make acute dystonia worse. Treatment depends on how problematic the symptoms are as they often resolve. In this case where the patient is distressed, the anticholinergic, benztropine IV would be the most appropriate treatment.

A 55-year-old man presents with a 1 day history of left sided facial weakness. 2 weeks previously he had been admitted to hospital under ENT with an otitis media requiring IV antibiotics. He had presented with severe left earache and fever. He had had a CT scan at this other centre which was reported as unremarkable. He had made a good recovery and was discharged after 3 days with a course of oral augmentin. He had made a good recovery, had been aware of some earache although this was much better than before. There was nothing else of note in his medical history.

On examination, he had a temperature of 37 C, a blood pressure of 132/80 mmHg and a pulse of 62 bpm. He had evidence of a left upper and lower facial muscle weakness but no other cranial nerve involvement was noted. Otherwise, balance was preserved and there were no cerebellar features. He had some cotton wool in his left ear and there was some reduction in hearing in this ear with an attempt to visualise the ear canal with an otoscope being unsuccessful as there appeared to be some fluid.

Which of the following is the most appropriate approach to the management of this patient?

- ○ Arrange further imaging of the head and ear canal
- ○ Commence gentamicin
- ○ Commence gentamicin with IV steroids
- ○ Treat with oral steroids and arrange OP review
- ○ Treat with oral steroids and oral acyclovir and arrange OP review

Arrange further imaging of the head and ear canal ← Correct answer — 40%

Commence gentamicin — 2%

Commence gentamicin with IV steroids — 10%

Treat with oral steroids and arrange OP review ✖ Incorrect answer selected — 19%

Treat with oral steroids and oral acyclovir and arrange OP review — 28%

**Explanation:**

This patient has a history of severe otitis media requiring admission and he has since developed a left isolated VII lower motor neurone palsy. Whilst Bell's palsy is a potential diagnosis, this cannot be purely attributed to Bell's, and one has to consider temporal bone erosion and dehiscence within the fallopian canal of the temporal bone within which the facial nerve resides. CT would probably provide the most appropriate imaging and the patient needs to be referred to ENT. Deterioration can result in Gradenigo's syndrome which is the involvement of the VIth cranial nerve and periorbital pain due to involvement of the Vth.

A 75 year old female was assessed in A&E having been brought into hospital by her husband in a confused state. They had been walking back from the shops and he stated that she started constantly asking where they were and what they had just been doing. This continued in the emergency department but by the evening post take ward round she was back to her normal self, although she couldn't recall the events of the day. The husband who was with her the whole time did not observe any limb weakness or facial asymmetry. Observations and bloods were unremarkable.

The most likely diagnosis is?

- ○ First presentation of dementia
- ○ Hypoglycemic event
- ○ Temporal lobe epilepsy
- ○ Transient ischaemic attack
- ○ Transient global amnesia

Hypoglycemic event 0%

Temporal lobe epilepsy 1%

Transient ischaemic attack 1%

Transient global amnesia ✔ 95%

Correct answer selected

The nature of the symptoms – constant questions, then rapid full recovery with no memory of the event – is strongly suggestive of Transient global amnesia.

A 55-year-old man presents with a one day history of weakness of the left side of his face and drooling. Other than a 2 year history of type 2 diabetes mellitus he has been well. He currently takes ramipril, simvastatin and metformin. He has recently commenced empagliflozin.

On examination, he had weakness of the lower and upper face and was unable to raise his eyebrows or purse his lips. There was no abnormality of the ear canal nor were there any other abnormalities of the cranial nerves. His blood pressure is 132/88 mmHg and his pulse is 88 bpm regular.

Investigations reveal:

| | |
|---|---|
| HbA1c | 62 mmol/mol (<48) |

Which of the following is most appropriate concerning the management of this patient?

- ○ Initially request CT of head
- ○ Request MRI of Cerebello-pontine angle
- ○ Stop empagliflozin
- ○ Switch metformin to insulin
- ○ Treat with oral steroids with OP review

Stop empagliflozin 10%

Switch metformin to insulin 2%

Treat with oral steroids with OP review ✔ Correct answer selected 59%

**Explanation:**

This man has developed an abrupt onset VII nerve palsy which is isolated and unilateral - the most likely diagnosis is Bell's Palsy. NICE guidance recommend treatment with oral steroids within 72 hours of onset as evidence would suggest improved prognosis and speedier resolution with steroids. There is no requirement for CT/MRI if there are no other features to suggest CPA involvement and poor glycaemic control in itself does not cause a Lower VII palsy.

**Reference:**

1. NICE Guidelines. Bell's Palsy [updated

A 24 year old lady is admitted under the acute medical team with sudden onset expressive dysphasia and right sided hemiplegia. She has suffered from migraine since the age of 16.

Clinical examination confirms increased tone in the right arm and leg. Power is graded 4/5 in all muscle groups of the right arm and leg and is 5/5 on the left. There is generalised hyper-reflexia and the right plantar is extensor. Sensation to light touch and vibration sense is preserved.

Investigations

CT Brain: Infarct in the left frontal lobe in the territory of the left middle cerebral artery.

| | | |
|---|---|---|
| **Anti dsDNA** | 5 U/L | (<20 U/L) |
| **ESR** | 32 mm/h | (0-10mm/h) |
| **CRP** | 39 mg/L | (<7mg/L) |
| **Lupus Anticoagulant** | Positive | |
| **Anti Cardiolipin IgG** | 45 GPLU/ml | (<10) |
| **Anti Cardiolipin** | 50 MPLU/ml | (<7) |

| | | |
|---|---|---|
| **IgG** | | |
| **Anti Cardiolipin IgM** | 50 MPLU/ml | (<7) |
| **Factor V Leiden mutation:** | Not detected. | |
| **Protein C activity** | 118% | (76-208%) |
| **Protein S activity** | 111% | (62-153%) |
| **Anti thrombin III** | 0.9 kIU/L | (0.8-1.2 kIU/L) |
| **Homocysteine** | 5.5micromol/L | (4.9-11.6micromol/L) |

ECG: sinus rhythm, 80 beats per minute, normal axis, normal morphology.

Which of the following is the next most appropriate investigation?

- ○ Anti Beta 2 Glycoprotein 1 Antibodies
- ○ Carotid and vertebral artery Doppler scan
- ○ Echocardiography
- ○ Lower limb Venous Doppler
- ○ MRI Brain

Doppler scan

Echocardiography ✔ Correct answer selected 25%

Lower limb Venous Doppler 4%

MRI Brain 16%

Antiphospholipid syndrome was first described by Hughes in 1983[1]. The most common cardiac manifestation of the disease is a non-bacterial thrombotic endocarditis[2], caused by platelet-fibrin thrombi forming on the endocardial surface of valves, with a prevalence of 11.6% reported[3]. An echocardiogram is an essential investigation for any patient presenting with a cerebral embolism to exclude an underlying cardiac cause such as mural thrombus, atrial myxoma, valvular vegetations, patent foramen ovale, and atrial or ventricular septal defects. Since her lupus anticoagulant and anti cardiolipin antibodies are both positive, testing for anti-beta2 glycoprotein1 antibodies would not provide any additional information at this stage. A repeat antiphospholipid screen in 12 weeks' time may be considered, but this is not relevant to this particular question. At her age she is unlikely to have significant atherosclerotic involvement of her carotid arteries to warrant a carotid arterial Doppler. If a paradoxical embolus was suspected, then an echocardiogram would be more urgently required than a venous Doppler scan of the leg. Her history does not suggest a cerebral vasculitis or encephalitis and therefore MRI would not take precedence over echocardiography in this case.

A 57-year-old man presents complaining of an episode of sudden onset severe dizziness which he noticed on waking. He describes the room spinning violently and has severe nausea and vomiting. He had symptoms of a heavy cold two weeks previously, although has been well recently.

He has a history of type two diabetes with a HbA1c of 96 mmol/mol, ischaemic heart disease with a previous myocardial infarction and a transient ischaemic attack two years ago which left no long standing neurological deficit.

He is currently taking gliclazide, metformin, bisoprolol, ramipril and clopidogrel.

His blood pressure is 165/91 mmHg with a heart rate of 94 bpm regular and in sinus rhythm. He was supported on entering the room with the help of his son due to his instability, and he had a broad based gait. He has gaze evoked nystagmus although no weakness, altered sensation or any other deficits of his cranial nerves.

What is the most likely diagnosis?

- ○ Benign paroxysmal positional vertigo
- ○ Cerebellar infarction
- ○ Meniere's disease
- ○ Migrainous vertigo
- ○ Vestibular neuronitis

vertigo

Cerebellar infarction ✔ Correct 31%

answer selected

Meniere's disease 3%

Migrainous vertigo 3%

Vestibular neuronitis 57%

The patient has risk factors for vascular disease, with poorly treated type two diabetes and evidence of hypertension. He has suffered previous ischaemic heart disease and a transient ischaemic attack indicating vascular disease.

He has features of central vertigo including gaze induced nystagmus and a wide based gait and is unable to mobilise without help.

The vertigo is of sudden onset and is severe.The above features point to a central cause of nystagmus and therefore require admission to secondary care for urgent investigation.

A 74 year old lady presents with a history of gradual weakness in her legs to an extent that she can no longer walk. She complains of back pains and numbness down both legs leading up to this presentation. There is no history of urinary or faecal incontinence. She has no significant past medical history except for previous carpal tunnel syndrome release and cervical spondylosis. On examination you find that there is full power in her upper limbs with intact reflexes and sensation. The legs are weak with absent knee and ankle jerks. There is loss of sensation to pinprick at the big toes of both feet, soles, and the back of both legs. There is perianal numbness and reduced sphincter tone.

What is the next appropriate investigation?

- Isotope bone scan
- MRI Cervical spine
- MRI Lumbar spine
- Nerve conduction studies
- Xray lumbar spine

MRI Lumbar spine ✔ Correct answer selected 94%

Nerve conduction studies 3%

Xray lumbar spine 2%

This lady has the classic features of a cauda equina syndrome:

- Back pain
- Radicular pain/numbness down the legs
- Areflexic paralysis of the legs
- Sensory loss in a root distribution
- Reduced sphincter power

She has bilateral lower leg flaccid weakness with absent reflexes and sensory disturbance with loss of perianal sensation. Usually these lesions present at an earlier stage with conus medullaris lesions: urinary retention , constipation , back pain, sacral sensory loss, with or without leg weakness, & saddle anaesthesia. Previous cervical spondylosis and carpal tunnel syndrome release are just distractors and bear no clinical relevance to the current symptoms.

A 46 year old homeless man was admitted in a confused state. The manager of the hostel which he sometimes attended had been worried about him as he had become more confused and complained of headaches over the last 2 weeks and had been vomiting the last 2 days. He was known to abuse alcohol.

On examination, he was confused but had a GCS of 15 and had a temperature of 37.6C. Otherwise, neurological examination was unremarkable.

Relevant investigations:

CT head – mildly enlarged ventricles

Lumbar puncture revealed:

| | |
|---|---|
| Clear fluid | |
| Opening pressure | 30 cm/H20 (10 -20cm H20) |
| Total protein | 2.8 g/l (0.15-0.45) |
| Csf Glucose | 1.8 mmol(>3.3 mmol) |
| White cells | 52 and 100% lymphocytes (<5) |
| Plasma glucose at time of LP | 5.9mmol/l (3.5-5.5) |

Gram stain and AFB stain were both negative

The most likely diagnosis is:

- ○ Cryptococcal meningitis
- ○ Cytomegalovirus meningitis
- ○ Herpes Simplex encephalitis
- ○ Tuberculosis meningitis

The most likely diagnosis is:

Peer responses

| | |
|---|---|
| Cryptococcal meningitis | 31% |
| Cytomegalovirus meningitis | 2% |
| Herpes Simplex encephalitis | 24% |
| Tuberculosis meningitis ✔ Correct answer selected | 42% |

This is Tuberculosis meningitis and empirical treatment is needed early here. Being homeless and heavy alcohol consumption are risk factors. The negative stains do not rule out TB meningitis and have a sensitivity of only 60%. TB meningitis classically has a raised opening pressure, lymphocytosis, raised protein and a very low glucose.

Bacterial meningitis would expect more neutrophils, viral meningitis typically has >60% serum glucose.

A 50 year old female smoker presents with a sudden onset headache. There were no precipitating factors. At the onset of the headache she was GCS 15 but on arrival in ED she is GCS 13 (E3 V4 M6). On examination, she has a left sided ptosis with a dilated pupil and the eye looking downwards and outwards. There is extensor plantar responses.

The most likely cause of her condition is:

- ○ Hypertensive intracerebral haematoma
- ○ Perimesencephalic subarachnoid haemorrhage
- ○ Subarachnoid haemorrhage (SAH) secondary to left middle cerebral artery aneurysm
- ○ Subarachnoid haemorrhage secondary to left posterior communicating artery aneurysm
- ○ Subarachnoid haemorrhage with hydrocephalus

Hypertensive intracerebral haematoma 7%

Perimesencephalic subarachnoid haemorrhage 6%

Subarachnoid haemorrhage (SAH) secondary to left middle cerebral artery aneurysm 6%

Subarachnoid haemorrhage secondary to left posterior communicating artery aneurysm ✔ Correct answer selected 76%

Subarachnoid haemorrhage with hydrocephalus 4%

This young woman presents with typical history of subarachnoid haemorrhage associated with a left third nerve palsy. This suggests a bleed associated with a posterior communicating artery aneurysm.

A 29 year old woman is admitted after collapsing in a gym. She was training in a spin class as she wanted to get fitter. She was pushing herself and then passed out. On coming around she felt groggy and had a headache. She was witnessed to collapse, didn't hit her head on falling and was out for about a minute without any fitting. The event happened about 4 hours previously as she had been referred to the medics by A+E. She had no medical history of note other than being on the oral contraceptive, microgynon.

On examination she appeared well was communicating and complaining of a headache. Pulse was 82 bpm reg, blood pressure 122/70 mmHg and oxygen saturations were 99% on air. There was no neck stiffness or photophobia. Neurological examination was otherwise normal and the fundi appeared normal. She underwent a CT headscan which had been requested by A+E and was reported as 'normal scan with no evidence of a subarachnoid bleed. Co-incidental note is made of a 13mm colloid cyst in the third ventricle'.

Which of the following is the most appropriate approach to the management of this patient?

- ○ Arrange lumbar puncture for analysis and xanthochromia
- ○ Arrange MRI headscan
- ○ Discharge and refer for a neurology outpatient appointment
- ○ Discharge with no further appointment required
- ○ Refer to neurosurgeons

neurology outpatient appointment

Discharge with no further appointment required 15%

Refer to neurosurgeons ✔ 10%

Correct answer selected

This patient presented with a collapse and a 13mm colloid cyst is noted in the third ventricle. This is a life threatening lesion that can occlude the third ventricle producing acute hydrocephalus. The patient may well have had a premonitory event where occlusion occurred then release. Although often asymptomatic they can present with acute hydrocephalus as evidenced by headache and collapse. Whilst many colloid cysts are asymptomatic and may not require treatment, some may occlude the foramen of monro causing hydrocephalus and herniation. If as in this case they become symptomatic or larger than 10mm, urgent referral to the neurosurgeons is required. A LP must not be performed as this can precipitate occlusion of the foramen of monro.

A 45 year old homeless male was admitted after being found collapsed on the street with empty blank brown plastic medication bottles strewn around him and an empty bottle of vodka.

On examination, he had a GCS of 10, was agitated, had a temperature of 39C and was hyperreflexic with clonus. He had a sinus tachycardia of 120 bpm and a blood pressure of 122/80 mmHg. Pupils were equal and reactive.

Which of the following is the likely drug that he has taken in overdose?

- Amitriptyline
- Fluoxetine
- Methanol
- Quetiapine
- Temazepam

| | | |
|---|---|---|
| | Amitriptyline | 17% |
| | Fluoxetine ✔ Correct answer selected | 64% |
| | Methanol | 4% |
| | Quetiapine | 14% |
| | Temazepam | 1% |

This homeless man has been found collapsed and inebriated and like many admissions to A&E the exact poisoning is unknown. He displays features of the serotonin syndrome as suggested by tachycardia, hyperreflexia, agitation and fever. The treatment is with sedation with benzodiazepines and cooling.

**Further Reading**

- Serotonin syndrome

A 79 year old woman is admitted via the GP with left sided weakness that had developed over the last two to three days. Three weeks ago she had fallen on compacted sand on the beach whilst playing with her grandchildren and had hit her head. She did not lose consciousness but was a bit dazed. She had a headache afterwards but seemed to recover. She was otherwise fit and well and took no medication.

On examination, GCS is 15, she had mild left sided weakness of arm and leg 4/5 with an equivocal plantar response.

CT head scan revealed a right sided chronic subdural haematoma with some compression of the right ventricle but no midline shift.

Which of the following is the most appropriate management plan for this patient?

- ○ Admit and refer to neurosurgery for evacuation
- ○ Admit and treat with dexamethasone
- ○ Admit and treat with mannitol
- ○ Discharge and treat with outpatient dexamethasone
- ○ Discharge with reassurance that it will resolve and arrange further CT in 3 months

Admit and treat with mannitol 3%

Discharge and treat with outpatient dexamethasone 1%

Discharge with reassurance that it will resolve and arrange further CT in 3 months 10%

This patient has a chronic subdural haematoma and associated hemiparesis, which has developed over the course of 3 weeks. The patient should be referred to neurosurgery and treated with burr hole evacuation. In chronic subdural with no midline shift and symptoms such as headache then observation with re-scanning can be undertaken. However, this patient has developed significant neurological deficit despite the lack of midline shift and therefore surgery is required.

## Further Reading

A 52 year old female with only hypertension in her past medical history is brought in as an emergency. Her GCS is 11/15 and her sister informs you she had been complaining of a severe headache and double vision earlier today and reports that she had also complained of a similar but less severe headache 2/52 ago. There is no evidence of head trauma.

The most likely diagnosis is?

- ○ Cerebral abscess
- ○ Meningioma
- ○ Pituitary Tumour
- ○ Subarachnoid haemorrhage
- ○ Subdural haematoma

Cerebral abscess 1%

Meningioma 2%

Pituitary Tumour 19%

Subarachnoid haemorrhage ✔ 76%

Correct answer selected

Subdural haematoma 2%

This is most likely a SAH from the history with an earlier sentinel bleed. The peak time for rebleeding is around 14 days.

**Further Reading**

- Subarachnoid Hemorrhage

A 60 year old male presents with a 3 week history of dysphasia and progressive right arm weakness. He has had headaches for 2 months. There is no history of seizures. There is no other history of note.

On admission, he is confused with a GCS of 14. Pulse is 88 bpm reg, blood pressure 130/78 mmHg and temperature is 37C. He had grade 3 power in the right upper limb, but no other deficit. Blood investigations are normal and Chest x-ray is normal. A CT brain with contrast demonstrates a 5cm irregular enhancing lesion in the left frontal lobe consistent with a primary brain tumour.

Which of the following is the most appropriate initial management for this patient?

- ○ Dexamethasone 4mg QDS
- ○ Hypertonic saline
- ○ Levetiracetam 250mg BD
- ○ Mannitol 20% 0.5g/kg IV
- ○ Phenytoin 300mg OD

Ufone 8:49 AM 44%
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Which of the following is the most appropriate initial management for this patient?

Peer responses

| | |
|---|---|
| Dexamethasone 4mg QDS ✔ Correct answer selected | 87% |
| Hypertonic saline | 0% |
| Levetiracetam 250mg BD | 5% |
| Mannitol 20% 0.5g/kg IV | 3% |
| Phenytoin 300mg OD | 3% |

The most appropriate initial treatment for this man who has reduced GCS associated with a likely tumour is attempting to reduce the associated with swelling with dexamethasone.

A 48-year-old woman with a history of migraine presents to the Emergency Department. She describes a two day history of headache. Initially over the counter analgesia had provided a degree of relief. However, on the second day she experienced the worst headache of her life located in the occiput and associated with vomiting. On examination she is distressed and tachycardia. There are no focal neurological deficits. A CT scan shows subarachnoid haemorrhage, and she is referred to the neurosurgical team for further investigation and management.

With regard to the investigation of subarachnoid haemorrhage how long after the headache onset should a lumbar puncture ideally be performed?

- ○ Immediately on presentation
- ○ 2 hours
- ○ 8 hours
- ○ 12 hours
- ○ 24 hours

12 hours ✔ Correct answer selected 89%

24 hours 2%

A 'thunderclap' headache warrants consideration of subarachnoid haemorrhage, and may be preceded by a 'sentinel headache'. The traditional investigation route includes a plain CT head scan, with or without lumbar puncture, and cerebral angiography in the face of remaining diagnostic uncertainty.

Sensitivity of a CT head scan is maximal within 12 hours of onset, subsequently dropping to 50% at 5 days. Conversely lumbar puncture should be performed a minimum of 6 hours, but ideally 12 hours, after the onset of symptoms.

The CSF sample must be stored in the dark to prevent bilirubin degradation and sent for analysis of cell count and blood breakdown products. Visually inspecting for xanthochromia is 50% sensitive, the CSF sample is therefore centrifuged and examined with spectrophotometry. Absorbance peaks for oxyhemoglobin (appearing 4-10 hours after a bleed) and bilirubin (appears 10 hours after a bleed) may be detected.

A 37 year old man was admitted with generalised weakness. He awoke 3 days ago and was aware of pins and needles in the hands and feet. He had some associated weakness in the legs which deteriorated resulting in his admission. He has no past medical history of note.

On examination, he had a BMI of 31kg/$m^2$, a pulse of 90 bpm reg and a blood pressure of 110/72 mmHg. He had diffuse weakness of all four limbs, more marked in the legs than the arms which was more proximal than distal. He could walk but was weak on rising and was slow and slightly incoordinate. He had loss of light touch and vibration to the knees and also in the hands. Tendon reflexes were absent in the lower extremities but present in the biceps and triceps.

Blood investigations including FBC, U+Es and LFTs were normal. Calcium was 2.2 mmol/l (2.2-2.6). CRP was 12 mg/dl (<5).

Which of the following is the likely diagnosis?

- ○ Acute inflammatory demyelinating polyneuropathy
- ○ Acute porphyric neuropathy
- ○ Hashimoto's encephalopathy
- ○ Hypokalemic periodic paralysis
- ○ Lyme disease

Acute inflammatory demyelinating polyneuropathy ✔ Correct answer selected — 92%

Acute porphyric neuropathy — 3%

Hashimoto's encephalopathy — 1%

Hypokalemic periodic paralysis — 2%

Lyme disease — 1%

This patient has a typical story of Guillain- Barre (AIDP) with ascending weakness and sensory loss. Often but not always, a premorbid flu-like illness is described although this may be innocuous and so missed in the history. Diagnosis can be confirmed with LP which shows acellular CSF with elevated protein.

A 42 year old man presented with headache. Two weeks ago, he was aware of a strain in his neck whilst lifting weights in the gym. He felt that this was a muscle strain. The neck strain resolved after a day or so but since then he became aware of headaches which were debilitating. The headaches are worse as the day progresses and are relieved by lying down. They tend to be focussed over his eyes. Sneezing or coughing would also make the headaches worse.

There were no abnormal findings on neurological examination and observations were otherwise normal. CT head revealed low lying cerebellar tonsils.

Which of the following is the most appropriate approach to the management of this patient?

- ○ Bed rest and hydration
- ○ IV acyclovir
- ○ Lumbar puncture with opening pressure measurement
- ○ MRI headscan
- ○ Neurosurgical referral

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Peer responses

| | |
|---|---|
| Bed rest and hydration ✔ Correct answer selected | 14% |
| IV acyclovir | 1% |
| Lumbar puncture with opening pressure measurement | 11% |
| MRI headscan | 30% |
| Neurosurgical referral | 44% |

This patient presents with typical features of a spontaneous low pressure csf headache with orthostatic features. It improves on lying down. This headache began after weight training with a pain in the neck. This is likely to be the spontaneous csf leak. Low lying cerebellar tonsils on the CT with this history suggests low pressure headache rather than this being due to a Chiari malformation. Doing a LP could make this headache worse.

A 59 year old woman attends A&E on a Saturday after suddenly developing dysarthria, diplopia, numbness and weakness of the right face and left hand which lasted approximately 2 hours. The symptoms have now resolved but she describes the symptoms coming on suddenly, over minutes. In her past medical history, she is treated for hypertension, hyperlipidaemia and has stable intermittent claudication not requiring any surgical intervention. She takes amlodipine, simvastatin and aspirin. She is a smoker of 5 cigarettes daily.

On examination, her pulse is 88 bpm irregular, BP 150/85 mmHg but neurological and cardiovascular examination is otherwise normal. There is no carotid bruit. CT scan is normal.

Investigations show normal routine blood tests and an ECG reveals atrial fibrillation.

Which of the following is the most appropriate approach to the management of this patient?

- ○ Admit, risk factor modification, anticoagulation and and arrange urgent specialist review
- ○ Admit, arrange urgent specialist review, echo and MRI as inpatient
- ○ Discharge with risk factor modification and review in TIA clinic
- ○ Discharge with risk factor modification, anticoagulation and review in TIA clinic
- ○ Discharge with risk factor modification and anticoagulation following outpatient MRI with TIA clinic

Admit, risk factor modification, anticoagulation and and arrange urgent specialist review ✔ Correct answer selected — 47%

Admit, arrange urgent specialist review, echo and MRI as inpatient — 25%

Discharge with risk factor modification and review in TIA clinic — 5%

Discharge with risk factor modification, anticoagulation and review in TIA clinic — 13%

Discharge with risk factor modification and anticoagulation following outpatient MRI with TIA clinic — 9%

This patient has presented with a typical TIA and requires risk factor assessment and modification, particularly blood pressure review and smoking cessation, together with anticoagulation – NOACS or warfarin are acceptable. The patient need not be admitted to facilitate this. There is a 10% risk of completed stroke following TLOF and this can be reduced by up to 80% with risk factor modification.

Recommendation from https://cks.nice.org.uk/stroke-and-tia#!scenario:1

- Discuss the need for admission or observation urgently with a stroke specialist if the person:
  - Has had more than one suspected TIA (sometimes known as crescendo TIA).
  - Has a suspected cardioembolic source or severe carotid stenosis. (our case fits in this category)
  - May be unable to attend for urgent review or lacks a reliable observer at home to contact emergency services if further symptoms occur.

A 70 year old man presents after a transient ischaemic attack involving weakness of the left arm and lasting approximately 2 hours. He has a past medical history of diabetes for which he takes metformin 1g bd, together with simvastatin 40mg daily and ramipril 10mg daily.

On presentation, his weakness has now entirely resolved. He has a pulse of 80 bpm regular and a blood pressure of 148/92 mmHg.

Which of the following denotes this man's ABCD2 score?

- 1
- 3
- 5
- 6
- 7

7 ✔ Correct answer selected 42%

The ABCD2 score is a risk assessment tool designed to stratify TIAs according to future risk of stroke.

A refers to age >60 =1

B refers to blood pressure with either systolic or diastolic >140/90 = 1

C – Clinical Features: Unilateral weakness with or without speech impairment =2. Speech impairment =1

D – Duration: 10-59mins =1. >60 mins = 2

2 – Type 2 diabetes = 1

In our example, the age =1, blood pressure =1, Clinical features =2, duration =2 and he has diabetes =1

The score is therefore 7 which is the maximal score indicating a high risk of a completed stroke 2, 7, 30 and 90 days after a TIA. With an ABCD2 score of 6-7 there is an approximate 10% risk of stroke at 7 days and the recommendation in this case is one of admission with observation.

You are asked to review a 76-year-old man in Accident and Emergency, who presents with acute onset abnormal movements affecting his left upper extremity associated with numbness. His past medical history includes hypertension. On examination you note irregular, large amplitude, flinging movements of the limb. You suspect he has had a stroke and organise a MRI brain scan. Where do you expect to find the lesion?

- Inferior colliculus
- Red nucleus
- Substantia nigra
- Sub-thalamic nucleus
- Superior colliculus

Red nucleus 12%

Substantia nigra 24%

Sub-thalamic nucleus ✔ 55%

Correct answer selected

Superior colliculus 7%

Hemiballismus is a rare but dramatic movement disorder, typified by involuntary large amplitude flailing movements. The underlying pathology may be metabolic dysfunction or a structural lesion in the contralateral region of the subthalamic nucleus, related afferent/efferent pathways, or interconnected deep brain nuclei. There are a variety of underlying causative aetiologies, and in older patients vascular events should be considered.

A lesion of the red nucleus can cause a resting tremor and choreoathetosis. The superior and inferior colliculi are involved in visual and auditory processing, respectively. Loss of dopaminergic neurones in the substantia nigra is implicated in the pathology of Parkinson's disease.

Question ID #7203

A 63-year-old man presents to the Emergency Department following a fall, causing a superficial laceration over his right shoulder blade. His daughter who attends with him gives a history of instability and frequent falls over the last 10 months. She feels his falls relate, in part, to 'taking risky chances' with his mobility. On examination the patient has a staring facial expression and reduced blink frequency. Axial rigidity and slow vertical saccadic eye movements are noted. What is the most likely diagnosis in this patient?

- Corticobasal degeneration
- Dementia with Lewy Bodies
- Idiopathic Parkinson's disease
- Progressive Supranuclear Palsy
- Multi-system atrophy

Progressive Supranuclear Palsy 65%

✔ Correct answer selected

Multi-system atrophy 13%

The diagnosis in this case is progressive supranuclear palsy.

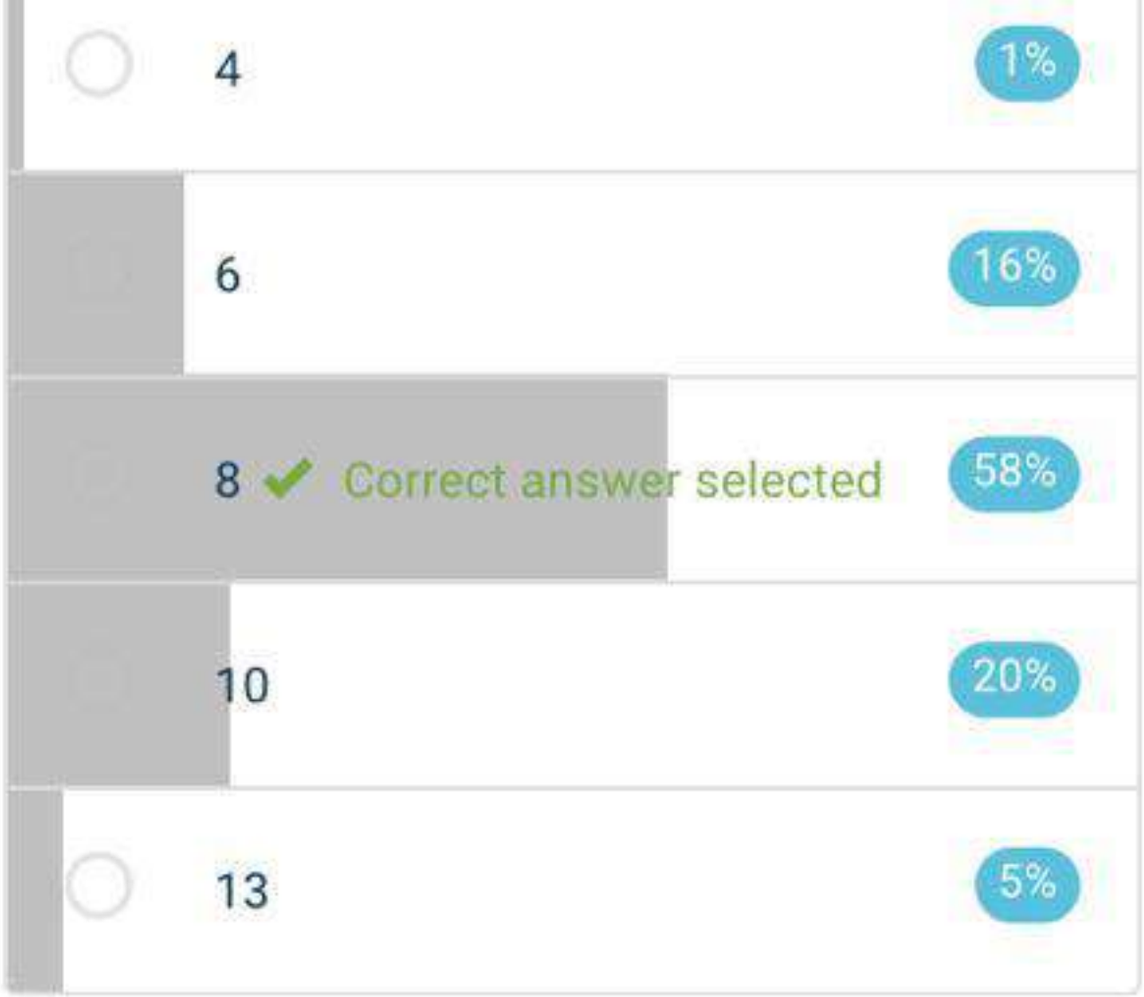
Characteristic features include a staring facial expression with frontalis overactivity and reduced blinking ('Mona-Lisa stare'), axial rigidity with retrocollis and an unsteady gait with tendency to fall backwards, bulbar involvement, supranuclear gaze palsy with impairment of downward gaze which may be preceded by slow saccades. The question above makes reference to the 'motor recklessness' of patients with progressive supranuclear palsy; patients who lack insight into their own postural instability may 'rocket' out of a seat unassisted.

The disease tends to develop between the ages of 55-70 years old, and it affects men more than women. Progressive supranuclear palsy progresses relatively rapidly, with a median survival time of 5.6 years.

A patient is admitted to the medical admissions unit. The patient is groaning, opens his eyes to painful stimuli and tries to pull his arm away when pressure is applied to a nail bed. Which of the following is the correct Glasgow Coma Scale score in this man's case?

- 4
- 6
- 8
- 10
- 13

| Feature | Response | Score |
|---|---|---|
| Best eye response | Open spontaneously | 4 |
| | Open to verbal command | 3 |
| | Open to pain | 2 |
| | No eye opening | 1 |
| Best verbal response | Orientated | 5 |
| | Confused | 4 |
| | Inappropriate words | 3 |
| | Incomprehensible sounds | 2 |
| | No verbal response | 1 |
| Best motor response | Obeys commands | 6 |
| | Localising pain | 5 |
| | Withdrawal from pain | 4 |
| | Flexion to pain | 3 |
| | Extension to pain | 2 |
| | No motor response | 1 |




GCS is based on the following scores:

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Eyes | Not open | Open to pain | Opens to voice | Spontaneous | N/A | N/A |
| Verbal | No sounds | Incomprehensible sounds | Inappropriate words | Confused disorientated | Orientated converses normally | N/A |
| Motor | No movement | Extends to pain | Abnormal flexion to pain | Flexion/withdrawal to pain | Localises to pain | Obeys commands |

Therefore, in this man's case, he opens his eyes to painful stimuli (E2), he makes incomprehensible sounds (V2) and withdraws to pain (M4). Therefore he has an overall GCS of 8. It is very important to be able to calculate the GCS accurately as it has prognostic value.

A 21 year old male presents with a sudden onset weakness and is unable to move for approximately 1 hour. He gives little other history except for losing two to three pounds in weight over the last two months. On admission to hospital, he has a pulse of 100 bpm, a blood pressure of 105/80 mmHg but he has made a full recovery and muscle strength is normal with normal reflexes and flexor plantar responses. His investigations reveal:

| | |
|---|---|
| **FBC** | Normal |
| **U+Es** | Normal |
| **LFTs** | Normal |
| **Calcium** | 2.25 mmol/l (2.2 - 2.6) |
| **Glucose** | 5.5 mmol/l (3.5 - 5.5) |

Which of the following would be an appropriate investigation for this patient?

- ○ 24hr Urine free cortisol
- ○ EMG
- ○ Oral glucose tolerance test
- ○ Thyroid function tests
- ○ Vitamin D concentration

24hr Urine free cortisol 6%

EMG 20%

Oral glucose tolerance test 7%

Thyroid function tests ✔ 54%

Correct answer selected

Vitamin D concentration 13%

This young male presents with a sudden onset of complete weakness with speedy recovery. The diagnosis suggests hypokalaemic period paralysis and one finds that the potassium is low only during the episodes of weakness. However, a form fruste of this is thyrotoxic periodic paralysis and the patient should have TFTs assessed.

A 45 year old male presents with a severe occipital headache that came on suddenly during sexual intercourse. He has otherwise been well without any other medical history of note. He has vomited 4 times. On examination, there is nothing to find and his GCS is 15 with no focal deficit. His headache started at 6am and he underwent a CT brain at 10am. The CT is reported as normal.

Which of the following is most appropriate in the management of this patient?

- CT angiogram
- Immediate Lumbar puncture
- Lumbar puncture after 12 hours
- MR angiogram
- No further investigation required can discharge

Lumbar puncture after 12 hours 67%

✔ Correct answer selected

MR angiogram 2%

No further investigation required 22%

can discharge

The history is suggestive of aneurysmal subarachnoid haemorrhage/leak. The CT is reported normal and what is now required is lumbar puncture. LP may be negative if performed less than 2 hours after an SAH occurs; It is most sensitive 12 hours after onset of symptoms.

A 35 year old lady presents with acute onset back and bilateral leg pain for the last 4 days. She also describes sensory loss in the right. She has not opened her bowels for 3 days and at 8am on the day of admission she was incontinent of urine. She has not passed urine since. She is overweight but otherwise has no significant past medical history. On examination, pulse is 80 bpm, blood pressure 122/80 mmHg, she is distressed by pain. She has reduced sensation over the sole of the foot on the right and perianally. The ankle relaxes are absent with normal knee reflexes though power of the lower limb is intact. There is flexor plantar response.

Initial investigations are normal including XR of the spine.

Which of the following is the most appropriate investigation in this patient?

- CT myelogram
- CT spine
- MR Angiography
- MRI lumbar spine
- Nerve conduction studies

12 hours ✔ Correct answer selected 89%

24 hours 2%

A 'thunderclap' headache warrants consideration of subarachnoid haemorrhage, and may be preceded by a 'sentinel headache'. The traditional investigation route includes a plain CT head scan, with or without lumbar puncture, and cerebral angiography in the face of remaining diagnostic uncertainty.

Sensitivity of a CT head scan is maximal within 12 hours of onset, subsequently dropping to 50% at 5 days. Conversely lumbar puncture should be performed a minimum of 6 hours, but ideally 12 hours, after the onset of symptoms.

The CSF sample must be stored in the dark to prevent bilirubin degradation and sent for analysis of cell count and blood breakdown products. Visually inspecting for xanthochromia is 50% sensitive, the CSF sample is therefore centrifuged and examined with spectrophotometry. Absorbance peaks for oxyhemoglobin (appearing 4-10 hours after a bleed) and bilirubin (appears 10 hours after a bleed) may be detected.

A 35 year old lady presents with acute onset back and bilateral leg pain for the last 4 days. She also describes sensory loss in the right. She has not opened her bowels for 3 days and at 8am on the day of admission she was incontinent of urine. She has not passed urine since. She is overweight but otherwise has no significant past medical history. On examination, pulse is 80 bpm, blood pressure 122/80 mmHg, she is distressed by pain. She has reduced sensation over the sole of the foot on the right and perianally. The ankle relaxes are absent with normal knee reflexes though power of the lower limb is intact. There is flexor plantar response.

Initial investigations are normal including XR of the spine.

Which of the following is the most appropriate investigation in this patient?

- CT myelogram
- CT spine
- MR Angiography
- MRI lumbar spine
- Nerve conduction studies

MR Angiography 2%

MRI lumbar spine ✔ Correct answer selected 89%

Nerve conduction studies 1%

This woman has acute onset of back pain associated with weakness, urinary retention, absent ankle jerks and loss of sensation in the S1 dermatome. The diagnosis is Cauda Equina syndrome and the most appropriate investigation is MRI lumbar spine.

Further reading:

Cauda Equina Medscape

| | CONUS MEDULLARIS SYNDROME | CAUDA EQUINA SYNDROME |
|---|---|---|
| Presentation | Sudden and bilateral | Gradual and unilateral |
| Reflexes | Diminished- at the level<br>Brisk- below the level | Diminished |
| Radicular pain | - | + |
| Low back pain | More | Less |
| Impotence | Frequent | Absent |
| Numbness | Symmetrical | Asymmetrical |
| Motor strength | Symmetric<br>Hyperreflexic<br>Distal paresis of lower limbs | Asymmetric<br>Areflexia<br>Paraplegia |
| Sphincter dysfunction | Present early<br>Both urinary and fecal incontinence | Present later<br>Only urinary retention |

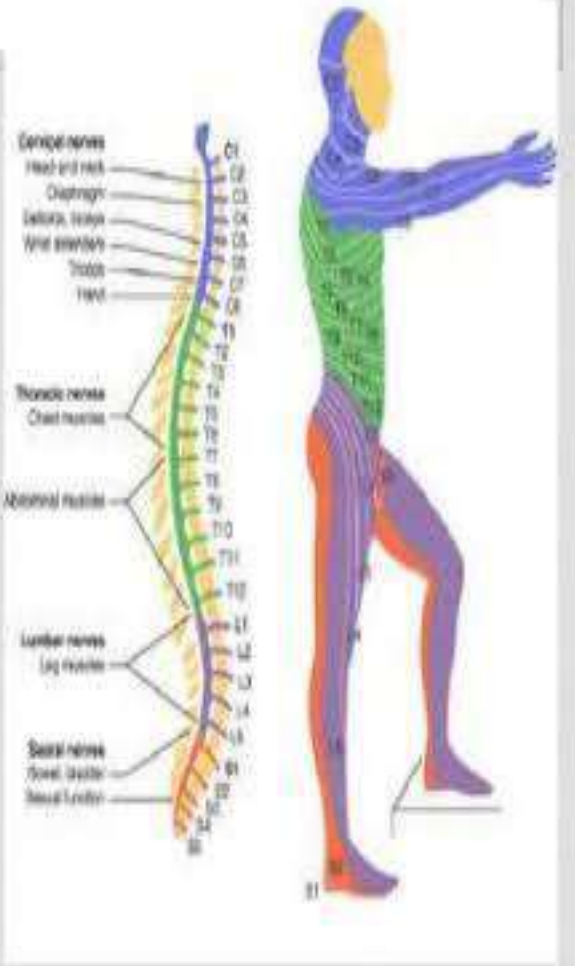
# CONUS MEDULLARIS SYNDROME

- Most distal bulbous part of spinal cord situated at level of **L1-L2 vertebral bodies** and comprises of sacral segments **S1-S5.**

- Signs shows involvement of:-

1. Saddle anesthesia ( S3-S5)
2. Absent Bulbocavernous reflexes ( S2-S4)
3. Absent anal reflexes ( S4-S5)

- Symptoms include both **upper and lower** motor neuron lesions.:
- LMN- at the level
- UMN- below the level



A 25-year-old female presents to Accident and Emergency with involuntary movements. Past medical history includes several bouts of depressive illness and an episode of psychosis. On examination Kayser-Fleischer rings are noted in the eyes. Dystonic movements affecting the right upper limb, a postural tremor, as well as a mildly ataxic gait are also noted. Bloods tests reveal derangement of her liver function tests.

Which of the following statements is correct about this disorder?

- ○ Blood tests reveal elevated serum caeruloplasmin
- ○ Inheritance is autosomal recessive
- ○ Reduced 24 hour urinary copper is found on 24 hour urine collection
- ○ The affected gene is on chromosome 4
- ○ Treatment includes a low zinc diet

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serum caeruloplasmin

Inheritance is autosomal recessive ✔ Correct answer selected 55%

Reduced 24 hour urinary copper is found on 24 hour urine collection 3%

The affected gene is on chromosome 4 7%

Treatment includes a low zinc diet 5%

Wilson's disease is an autosomal recessive disorder of copper metabolism, resulting from mutation in the adenosine triphosphate 7B gene (ATP7B) on chromosome 13. Subsequent impairment in copper excretion into bile contributes to copper accumulation in organs such as the brain and liver. Neurological features include movements disorders such as parkinsonism, tremor, dystonia and ataxia. Psychiatric features range from behavioural disturbances, through to mood disorders such as depression, as well as psychosis. Biochemical investigations yield reduced serum caeruloplasmin and increased serum and 24 hour urinary copper. Examples of treatment strategies include a low copper diet, D-penicillamine and zinc supplementation.

A 75 year old woman presents to the MAU on Sunday with recurrent episodes of right hand numbness and slurred speech which have occurred on approximately 10 occasions over the last 2 weeks. The episodes are all very similar in nature, each lasting 10 to 40 minutes with complete resolution of the weakness and numbness. They tend to occur at any time of day and come on quite suddenly. In her past history she has been treated for hypertension with amlodipine and also takes simvastatin. She had a right hip replacement 3 years ago which was uneventful.

On examination, she feels that her symptoms have now entirely resolved and there are no neurological deficits on examination. Blood pressure is 136/84 mmHg. CT head scan is reported as normal.

Which of the following is the most appropriate approach to the management of this patient?

- Admit and request specialist review
- Admit, give antiplatelet therapy and specialist review
- Discharge with no further follow up required
- Discharge without antiplatelets and refer to TIA clinic
- Give aspirin, discharge and organise TIA clinic referral

Admit and request specialist review 6%

Admit, give antiplatelet therapy and specialist review ✔ Correct answer selected 62%

Discharge with no further follow up required 0%

Discharge without antiplatelets and refer to TIA clinic 0%

Give aspirin, discharge and organise TIA clinic referral 32%

This patient presents with transient loss of function which is typical of TIAs within the carotid territory. This is crescendo TLOF where 2 or more events occur within 1 week, signifying a bad prognosis. The patient requires admission as there is a significant risk of a full blown stroke, and also requires appropriate specialist stroke review with risk factor assessment including carotid dopplers and echo.

A 30 year old woman was transferred from the psychiatric unit to the medical unit with acute confusion. She had been admitted two weeks previously under psychiatry with agitation, auditory hallucinations and catatonia. There was no past history of note and she was otherwise well and taking the combined oral contraceptive pill. She was initially commenced on fluoxetine which failed to improve her condition and then commenced olanzapine.

On examination, she was agitated and confused. GCS was 15 and her temperature was 37C. Pulse 88 bpm and blood pressure 122/88 mmHg. There was no focal neurology and her reflexes were normal with downgoing plantar responses.

Routine bloods were normal. CT scan and MRI were reported as normal and her lumbar results revealed:

| | |
|---|---|
| Protein | 0.44 g/l(<0.45) |
| Glucose | 3.7 mmol/l (>3.5) |
| White cell count | 19 cells/microl 90% lymphocytes (0-5) |

Which of the following is the likely diagnosis?

- ○ Acute catatonic schizophrenia
- ○ Anti-NMDA receptor encephalitis
- ○ Herpes simplex encephalitis
- ○ Neuroleptic malignant syndrome
- ○ Serotonin syndrome

Acute catatonic schizophrenia 7%

Anti-NMDA receptor encephalitis 29%

← Correct answer

Herpes simplex encephalitis ✖ 43%

Incorrect answer selected

Neuroleptic malignant syndrome 11%

Serotonin syndrome 11%

This patient displays typical features of anti-NMDA (N-methyl D-aspartate) receptor encephalitis presenting with subacute agitation, confusion and psychiatric symptoms such as hallucinations and catatonia. The condition affects young females in particular and is often paraneoplastic in aetiology, being associated with ovarian tumours. It is treated by identifying any paraneoplastic precipitant and immune therapy – immune globulin and steroids. The condition is diagnosed by demonstrating the antibodies in the csf.

**Further Reading**

A 45 year old plumber is admitted to the acute medical ward with generalised arthralgia and an inflamed left eye confirmed as uveitis by the ophthalmologists. Examination reveals bilateral parotid swelling and an effusion of the left knee and synovitis of both wrists.

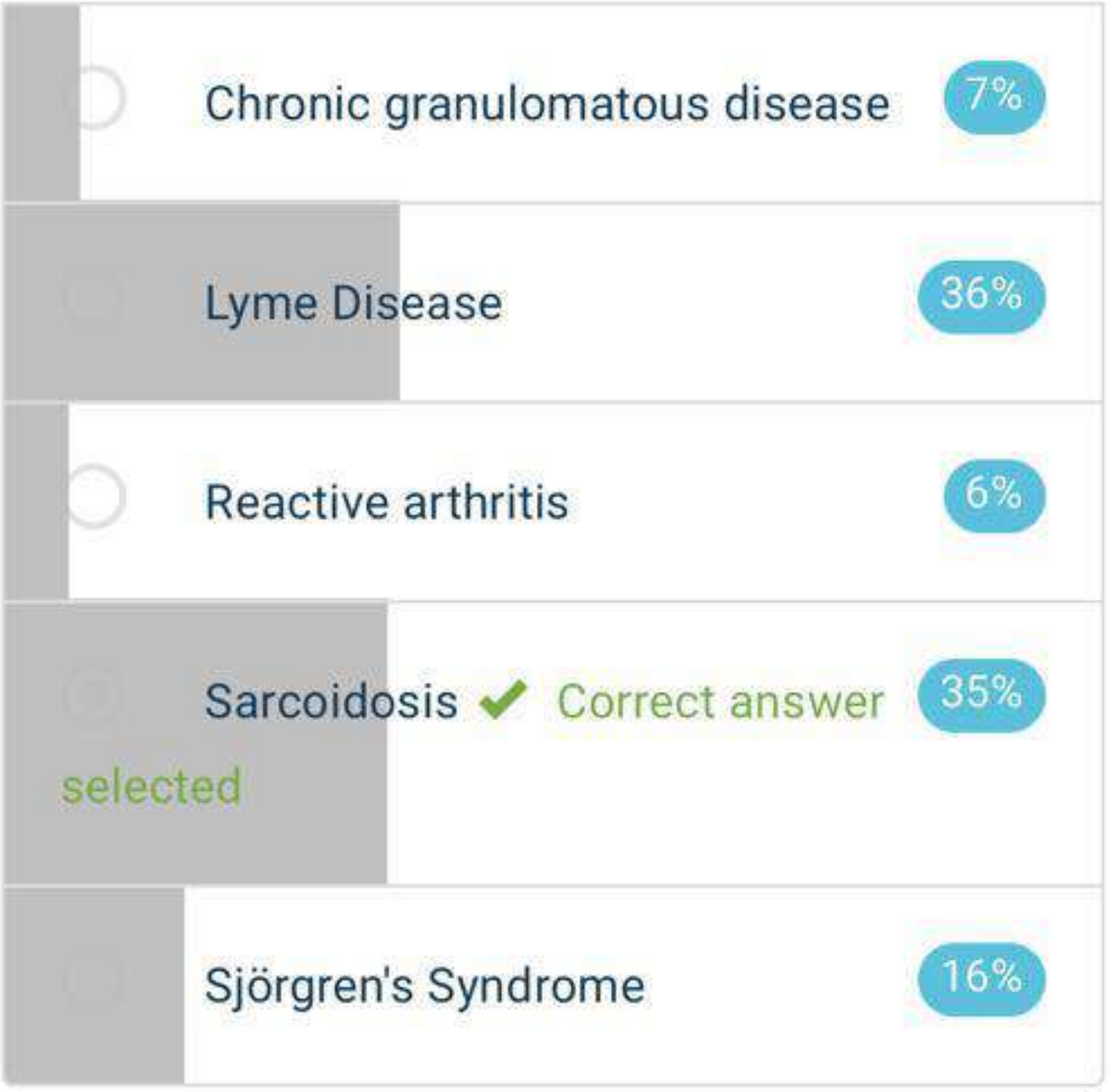
Initial investigations demonstrate:

| | |
|---|---|
| **Haemoglobin** | 12.9 g/dl (13.5-17.7) |
| **Creatinine** | 75 umol/L (50-100) |
| **ESR** | 65 mm/hr (0-10) |
| **CRP** | 43 mg/dl (<5) |
| **ANA** | Negative |
| **Rheumatoid Factor** | Negative |
| **Serum ACE level** | 40 IU/L (8-52) |

2 days after admission the patient is reviewed on the ward round and noted to have developed a left sided seventh cranial nerve palsy.

What is the most likely diagnosis?

- Chronic granulomatous disease
- Lyme Disease
- Reactive arthritis
- Sarcoidosis
- Sjörgren's Syndrome




The combination of uveitis, parotiditis and a facial nerve palsy (Heerfordt's syndrome) is highly suggestive of sarcoidosis. The normal serum ACE in this man should not exclude the diagnosis of Sacroidosis and even if elevated is not diagnostic. The other diseases listed may share many of the features of sarcoidosis particularly Sjörgren's Syndrome. Chronic granulomatous disease is a primary immune deficiency syndrome which usually presents early in life with recurrent infections but an X-linked form of the disease can present in adulthood.

Reference:

A 26-year-old woman presents to the emergency department with a two week history of headache (VAS 6-7/10). A collateral history from her partner reveals that for the last 5 days she has been excessively "sleepy and tired". She is a smoker (10 cigarettes per day for the last 7 years) and has taken the combined oral contraceptive pill for two years, but otherwise her history is unremarkable. Her mother had a DVT after a 4-hour flight at the age of 38.

On examination she is drowsy (GCS 13/15 – E3: V4: M6). There is no neck stiffness, but she is mildly photophobic, with mild left sided weakness (4/5). Fundoscopy is normal and there are no other neurological findings. Body temperature is 37.4C; RR 18; blood pressure 108/76; HR 91; Sats (room air) 97%.

Blood tests:

| Test | Result | Normal range |
|---|---|---|
| Wbc | 13.2× 109/L | 4.5 to 11.0 × 109/L |
| d-dimer | 974 ng/ml | <230 ng/ml |
| CRP | 36 mg/L | <8 mg/L |

A CT brain with CT venogram reveals a

A CT brain with CT venogram reveals a hypodensity in the right parietal region with gyriform hyperdense areas within the hypodensity; findings in keeping with a venous stroke and moderately extensive secondary haemorrhage. Filling defects in the sagittal sinus are consistent with cerebral venous thrombosis. There is no midline shift.

What is the most appropriate treatment option?

- (●) Aspirin 300mg for 14 days then switch to clopidogrel 75 mg
- ( ) Ceftriaxone 2g iv with aspirin 75 mg and dexamethasone 8 mg iv
- ( ) HASU/ITU admission for neuro-observation and supportive treatment only
- ( ) Initial anticoagulation with treatment dose of LMWH
- ( ) Prednisolone 60 mg with aspirin 300 mg

2. **An 86-year-old man presented to the acute medical take after being found in his nursing home unresponsive and jerking. The ambulance crew described what looked like seizure activity. This lasted around seven minutes and had terminated spontaneously by the time he reached hospital. He had a history of hypertension, hypercholesterolaemia, ischaemic heart disease, and a previous ischaemic stroke, which had left him with a residual left-sided hemiplegia. He required help with personal care and transfers in the nursing home but was able to get around in a wheelchair and enjoyed watching television and visits from his family.**

**The emergency department doctor stated he was initially drowsy but when you assessed him his Glasgow Coma Score (GCS) was 15. He had spastic paralysis of the left arm and leg; the rest of the examination was normal. Full blood count, urea and electrolytes, liver function tests, CRP, ECG, CXR, and urinalysis were all unremarkable. He had a CT of brain which showed an area of old infarction consistent with his previous stroke, extensive small vessel disease, and generalized cerebral atrophy.**

**What is the best management strategy?**

A. Discharge with no further investigation or treatment
B. EEG
C. LP to rule out encephalitis
D. MRI brain
E. Start lamotrigine

switch to clopidogrel 75 mg

Ceftriaxone 2g iv with aspirin 75 mg and dexamethasone 8 mg iv — 0%

HASU/ITU admission for neuro-observation and supportive treatment only — 27%

Initial anticoagulation with treatment dose of LMWH ✔ Correct answer selected — 67%

Prednisolone 60 mg with aspirin 300 mg — 0%

Even in the presence of haemorrhage anticoagulation is recommended for treatment of cerebral venous thrombosis. The rationale is to prevent thrombus extension, to facilitate recanalization and to prevent DVT or PE. Initial anticoagulation is usually weight based Low Molecular Weight Heparin or adjusted dose of Unfractionated Heparin followed by Vitamin K antagonists.

An 80 year old woman is admitted following an hour history of weakness and loss of speech affecting the left side of the body. By the time she is admitted the weakness has resolved and her speech is improving.

She has a history of hypertension for which she takes amlodipine 10mg daily. She also takes atorvastatin 10mg daily. Otherwise she is well with no other history of note.

On examination, her blood pressure is 144/80 mmHg and her pulse is 68 bpm regular.

Which of the following most accurately suggests the approximate risk of this patient having a stroke within the next week?

- <1%
- 5%
- 10%
- 25%
- 40%

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# ABCD$^2$ Score

CALCULATOR | NEXT STEPS | EVIDENCE | CREATOR

Initial BP. Either SBP ≥ 140 or DBP ≥ 90.

## Clinical features of the TIA

| | |
|---|---|
| **Unilateral weakness** | **+2** |
| Speech disturbance without weakness | +1 |
| Other symptoms | 0 |

## Duration of symptoms

| | |
|---|---|
| <10 minutes | 0 |
| **10-59 minutes** | **+1** |
| ≥ 60 minutes | +2 |

RESULT

# 5 points

Per the validation study, 4-5 points: Moderate Risk
2-Day Stroke Risk: 4.1%
7-Day Stroke Risk: 5.9%
90-Day Stroke Risk: 9.8%

**2. E.** Start lamotrigine

This patient has presented with a history of a single generalized seizure with a period of post-ictal drowsiness but has now returned to their pre-morbid state.

In the acute setting, single generalized seizures in the elderly will most commonly be secondary to another medical condition such as a metabolic disturbance or acute intracranial pathology such as acute stroke, encephalitis, or a space-occupying lesion. However, once initial investigations have ruled out metabolic disturbance and there is no evidence of ongoing encephalopathy, the commonest cause of epilepsy in the elderly is cerebrovascular disease.

A CT head in this situation is sufficient to rule out a space-occupying lesion such as a tumour or abscess. The role of MRI in investigation of epilepsy is to detect rarer conditions such as hippocampal

sclerosis, developmental abnormalities, or causes of encephalopathy not apparent on CT and LP and, therefore, would not be indicated in this age group and clinical setting.

The post-ictal period after a seizure typically lasts a few hours. If the drowsiness/confusion had not resolved then further investigation with an LP would have been the appropriate next step to rule out encephalitis.

After a single generalized seizure in younger patients, anti-epileptic treatment would not usually be initiated. However, as the cause of the seizure in this patient is cerebrovascular disease, the risk of seizure recurrence is very high and, therefore, treatment is indicated.

Seizures after stroke can occur early after stroke within a few days or develop months after the stroke. The seizures are focal in onset and could present as simple partial, complex partial, or, as in this case, secondary generalized.

The choice of anti-epileptic is not influenced directly by age or seizure aetiology but is determined by whether the seizures are focal onset or generalized as well as the side effect profile of the various antiepileptic drugs. The SANAD trial recommends the use of lamotrigine as the first-line agent for focal onset epilepsy. Its main disadvantage is its long dose escalation. Where seizures are more frequent then an alternative drug that would reach a therapeutic dose more rapidly could be indicated. Some drugs are often poorly tolerated in the elderly, such as sodium valproate, which can cause encephalopathy and, more rarely, Parkinsonism.

Marson A et al. The SANAD study of effectiveness of carbamazepine, gabapentin, lamotrigine, oxcarbazepine, or topiramate for treatment of partial epilepsy: an unblinded randomised controlled trial. Lancet 2007; 369(9566): 1000–1015.

The important issue here is to calculate this patient's ABCD2 score. The ABCD2 score is a risk assessment tool designed to stratify TIAs according to future risk of stroke.

A refers to age >60 =1

B refers to blood pressure with either systolic or diastolic >140/90 = 1

C – Clinical Features: Unilateral weakness with or without speech impairment =2. Speech impairment =1

D – Duration: 10-59mins =1. >60 mins = 2

2 – Type 2 diabetes = 1

In this case the patient scores 6 based on age, clinical features and duration. This suggests quite a high risk of future stroke of about 12% at 7 days, with guidance suggesting the patient be admitted, investigated and treated.

An 18 year old male of Asian origin was admitted feeling unwell with a headache that had developed over the last 24 hours. He was otherwise fit and well. His only recent travel history was a visit to Pakistan 2 months ago.

On examination, he had a temperature of 38.8C, some mild neck stiffness and mild photophobia. His pulse was 88 bpm, blood pressure 118/80 mmHg. No obvious rash was present and there were no abnormal neurology.

Results reveal:

| | |
|---|---|
| FBC | Normal |
| U+Es | Normal |
| CRP | 15 mg/dl (<5) |

CT head was reported as normal and the patient then went on to have a lumbar puncture, the results of which reveal:

| | |
|---|---|
| Appearance | Clear |
| Protein | 0.42 mg/l (<0.4) |
| Glucose | 4.2 mmol/l (>3.3) |
| White cells | 83/ul (0-5) |

CT head was reported as normal and the patient then went on to have a lumbar puncture, the results of which reveal:

| | |
|---|---|
| Appearance | Clear |
| Protein | 0.42 mg/l (<0.4) |
| Glucose | 4.2 mmol/l (>3.3) |
| White cells | 83/ul (0-5) |
| Red cells | 20 / ul (0-5) |

Which of the following is the most likely diagnosis?

- ○ Aseptic meningitis
- ○ Bacterial meningitis
- ○ Migraine
- ○ Subarachnoid haemorrhage
- ○ Tuberculous meningitis

| | | |
|---|---|---|
| Aseptic meningitis ✔ Correct answer selected | | 45% |
| Bacterial meningitis | | 15% |
| Migraine | | 0% |
| Subarachnoid haemorrhage | | 6% |
| Tuberculous meningitis | | 35% |

This patient is likely to have aseptic meningitis from the description in the history and the LP findings. The slight elevation of the WCC and protein would be in keeping with this diagnosis. We are not given any history regarding the microbiological assessment or gram staining of the CSF as is often the case. The patient should be treated with analgesia and can be discharged. The correct interpretation of the CSF is important in acute medicine and will be a focus in exams.

A 43 year old man is admitted under the general medical intake with generalised progressive weakness of his arms and legs. During the preceding 5 days he complained of flu like symptoms and muscle aches. There is no change in his symptoms after exercise such as walking up a flight of stairs. He compares the discomfort in his legs to a "swarm of bees crawling over his thighs". He has noticed difficulty in swallowing but no nasal regurgitation of liquids. His speech and facial expression remain unchanged. There is no family history of muscle disorders.

On examination he displays marked truncal weakness and has difficulty even to sit upright. He has difficulty holding his head up. The muscle bulk of his arms and legs appear normal with no wasting or hypertrophy. There is no fasciculation of the muscles. His limb tone is reduced, and power graded 3/5 on hip flexion and shoulder abduction. Cranial nerve examination is normal. Respiratory examination is unremarkable.

| | | |
|---|---|---|
| **CK** | 13,000 U/L | (30-200 U/L) |
| **CRP** | 120mg/L | (<5mg/L) |
| **ESR** | 87 mm/h | (<10mm/h) |

Urine dipstick: No abnormalities detected

Urine dipstick: No abnormality detected.

Urine myoglobin: Not detected.

| | | |
|---|---|---|
| **Sodium** | 135 mmol/L | (135-145) |
| **Potassium** | 4.3 mmol/L | (3.5-5.0) |
| **Urea** | 5.9 mmol/L | (2.5-7.0) |
| **Creatinine** | 105 micromol/L | (70-110) |
| **25OHVit D** | 52 ng/L | (desirable levels > 30ng/L) |
| **Free T4** | 20.8 pmol/l | (9.8 - 23.8) |
| **TSH** | 2.2 mu/l | (0.5-4.5) |

Electromyography is reported as:

Myopathic potentials: low amplitude, short duration polyphasic units on voluntary activation. Increased spontaneous activity with fibrillations and complex repetitive discharges.

Which is the most likely diagnosis?

- ○ Limb-girdle muscular dystrophy
- ○ McArdle's syndrome
- ○ Motor neurone disease
- ○ Polymyositis
- ○ Rhabdomyolysis

Polymyositis ✔ Correct answer 56%

selected

Rhabdomyolysis 2%

Although there is a tendency to overdiagnose polymyositis, this is the most likely diagnosis of the options listed. The presence of symmetrical proximal muscle weakness, dysphagia, elevated CK, and myopathic EMG findings are highly suggestive of polymyositis. Alanine (ALT) and aspartate (AST) transaminases are often raised in polymyositis. A muscle biopsy would be needed to confirm the diagnosis. It is important to determine this patient's autoantibody status, particularly with regard to anti-tRNA synthetase antibodies- which are positive in 30% of polymyositis patients (also known as Anti-Jo1 antibodies) - since this is associated with interstitial lung disease, Raynaud's phenomenon, "mechanic's hands" (manifest as roughened cracked skin of the fingers), and arthritis. The presence of anti-synthetase antibodies carries a poorer prognosis[1].

Myoglobinuric acute renal failure has been reported in polymyositis, but is rare[2]. The absence of fasciculation and bulbar symptoms, and myopathic EMG findings makes motor neurone disease unlikely. Limb-girdle dystrophy is typically characterised by marked hypertrophy of the calves, but with gross muscle weakness. This gentleman's muscle bulk appears normal, making limb girdle dystrophy unlikely. McArdle's syndrome is characterised by a "second wind phenomenon" where patients experience weakness on exercise, but then following a brief period of rest the muscle power returns significantly better than before. During exacerbations of McArdle's disease patients may be at risk of rhabdomyolysis. His

A 21 year old male student is brought to A+E by his friends who have been increasingly concerned about him as he took a hallucinogenic substance the day before and had a 'bad trip'. Since then, he has become confused and drowsy. They do not know what substance he took but informs you that he has taken recreational drugs before.

On examination he is drowsy with a GCS of 12, blood pressure of 112/72 mmHg and a pulse of 110 bpm. He also has a liver flap. His oxygen saturations are 99% on air. There are no specific abnormalities on neurological examination.

His blood results reveal:

| | |
|---|---|
| FBC | Normal |
| U+Es | Normal |
| CRP | 55 mg/l (<5) |
| Bilirubin | 50 micromole/l (0-18) |
| Alkaline Phosphatase | 250 IU/l (50-110) |
| AST | 1500 IU/l (10-50) |
| ALT/td> | 1500 IU/l (10-500 |

Which of the following is the likely cause for his presentation?

- ○ Amphetamines
- ○ Cocaine
- ○ Ecstasy (MDMA)
- ○ Ketamine
- ○ Psychedelic mushrooms

Ecstasy (MDMA) 21%

Ketamine 12%

Psychedelic mushrooms ✔ 57%

Correct answer selected

This young man has developed acute liver failure as a likely consequence of the ingestion of a hepatotoxic drug. Such drugs include psychedelic mushrooms, anti-TB therapy, anticonvulsants and paracetamol. In this case the consumption of psychedelic mushrooms may well be the precipitant of acute liver failure with psilocybin mushrooms often being confused with amatoxin mushrooms, which can produce fatal hepatotoxicity.

A 42 year old business man attends the clinic following a recent acute admission with an unprovoked generalized tonic-clonic seizure. This was his first ever seizure. His CT and MRI brain are both normal as is his EEG. He is very keen to resume driving (standard driving licence). How long does the DVLA state he cannot drive for?

- 3 months
- 6 months
- 9 months
- 12 months
- Can commence driving immediately as investigations are normal

3 months 1%

6 months ✔ Correct answer selected 74%

9 months 2%

12 months 20%

Can commence driving immediately as investigations are normal 3%

After a single unprovoked seizure, an individual can resume driving after 6 months provided there is low risk of seizure recurrence; this is likely here given no structural abnormalities were found and no epileptiform activity on EEG.

**Further Reading**

A 68 year old man is admitted on the acute medical take, via the GP, following repeated episodes of falling. He was living at home with a four times a day package of care, and family assistance, but had become increasingly dependent on his family as his mobility had significantly deteriorated over the past 6 months.

On admission the patient is complaining of hallucinations and is concerned that the nursing staff are "out to get him". He is not aggressive but his family states that these hallucinations have been worsening and at times he can be very disorientated and confused.

Physical examination is unremarkable apart from some minor cogwheeling rigidity in his hands, and a shuffling gait with reduced arm swing. He showed evidence of mild cognitive deficit on testing, and was unable to draw a clock.

Bloods were in the normal range, ECG showed normal sinus Rhythm and CT head showed mild small vessel disease.

He is finding the hallucinations to be distressing. What is the most appropriate treatment for this?

- ○ Haloperidol
- ○ Lorazepam
- ○ Pramiprexole
- ○ Rivastigmine
- ○ Trazadone

| | | |
|---|---|---|
| C | Haloperidol | 18% |
| D | Lorazepam | 19% |
| E | Pramiprexole | 17% |
| B selected | Rivastigmine ✔ Correct answer | 41% |
| A | Trazadone | 5% |

The patient has features of Parkinsonism with a worsening mobility, frequent falls, fluctuating levels of lucidity and hallucinations suggesting a diagnosis of Lewy Body Dementia.

Anticholinergic medication and typical antipsychotics medication are contraindicated in Lewy Body Dementia. Anticholinergic medication increases the mortality when used in Lewy Body Disease three times above average.

StudyPRN

# Acute Medicine SCE Revision Renal medicine

A 55 year old man is admitted through MAU with 1 week history of deteriorating weakness and more recent nausea. His background includes a 10 yr history of diabetes and hypertension. He is taking gliclazide 80mg bd, bendrofluazide 2.5mg/d, atorvastatin 10mg/d and ramipril 10 mg/d.

On Examination he appears ill and weak. His temperature is 37 C and oxygen saturation is 97% on air. His blood pressure is 154/100 mmHg, heart rate 92 bpm reg and respiratory rate is 22/min.

Results:

| | |
|---|---|
| Sodium | 141 mmol/l (134-144) |
| Potassium | 7.6 mmol/l (3.5-5.5) |
| Urea | 19 mmol/l (3-8) |
| Creatinine | 350 micromol/l (50-100) |
| pH | 7.36 |
| Bicarbonate | 20 mmol/l |

His ECG reveals some QRS widening and tenting of T waves.

Which of the following is the most appropriate initial treatment for this man?

Which of the following is the most appropriate initial treatment for this man?

- 10mg nebulised salbutamol
- 10mls 10% IV calcium gluconate as a stat dose
- 100mls of 8.4% sodium bicarbonate given over 30 mins
- 50mls IV 50% dextrose plus 10 iu insulin given over 10 mins
- Oral Calcium resonium

10mls 10% IV calcium gluconate as a stat dose ✔ Correct answer selected 88%

100mls of 8.4% sodium bicarbonate given over 30 mins 0%

50mls IV 50% dextrose plus 10 iu insulin given over 10 mins 12%

Oral Calcium resonium 0%

This patient has severe and life threatening hyperkalaemia as determined by the potassium above 6.5 and the widened QRS complexes and tented T waves on the ECG. The most important initial step is protection of the heart – hence the patient should receive 10 mls calcium gluconate and the ECG should be repeated to look for improvement. At the same time, the insulin and dextrose infusion should be started, although this may take 1 hour to take effect by reducing the potassium. In this case, the ACE inhibitor needs to be stopped and in conjunction with the acute kidney injury may be the precipitant.

A 40 year old Asian gentleman has been referred from the liver clinic where he is being treated for hepatitis C with pegylated interferon and ribavirin for the last 12 weeks. Over the last 3 weeks the patient has noted swelling of his ankles and feet along with shortness of breath on exertion. There is no history of a decrease in urine output, although he has noted frothing of urine.

On examination, he has a blood pressure of 130/80 mmHg, a pulse rate of 100/minute and a temperature of 38C. He has significant pedal edema. On chest examination, he has dull percussion note at both bases with decreased breath sounds and decreased vocal fremitus. On abdominal examination, there is no visceromegaly but shifting dullness is present.

Laboratory investigations reveal:

| | | |
|---|---|---|
| Hb | 11.6 g/dl | 13-18 g/dl |
| WBC | 9 x $10^9$/l | 4-11 x $10^9$/l |
| Platelets | 455 x $10^9$/l | 150-300 x $10^9$/l |
| PT | 12 seconds | 12-14 seconds |
| APTT | 34 seconds | 30-46 |

| | | |
|---|---|---|
| | | seconds |
| Urea | 23 mmol/l | 2.5-6.7 mmol/l |
| Serum creatinine | 488 mmol/l | 88-120 mmol/l |
| Bilirubin | 3 umol/l | 2-17 umol/l |
| ALT | 35 iu/l | 5-40 iu/l |
| Serum albumin | 22 g/l | 34-48 g/l |
| C3, C4 | Within limits | |
| Anti HCV | Positive | |
| HCV PCR RNA | Not detected | |
| HBsAg | Negative | |

Urine Analysis

| | | |
|---|---|---|
| Blood | Nil | |
| Protein | ++++ | (24 hours quantification: 6.7g) |
| Glucose | + | |
| Microscopy | Few hyaline casts | |

What is the most likely diagnosis?

- ○ Amyloidosis
- ○ Diabetic nephropathy
- ○ HCV related cryoglobulinemia
- ○ HCV related membranoproliferative glomerulonephritis
- ○ Interferon induced focal segmental glomerulosclerosis

HCV related cryoglobulinemia 25%

HCV related membranoproliferative glomerulonephritis 43%

Interferon induced focal segmental glomerulosclerosis ✔ Correct answer selected 26%

The main causes of nephrotic range proteinuria include diabetic nephropathy, minimal change disease, focal segmental glomerulosclerosis, membranous nephropathy and amyloidosis. Hepatitis C related renal disease manifests as either membranoproliferative glomerulonephritis, membranous nephropathy or cryoglobulinemia. The mainstay treatment in all 3 cases remains treatment of hepatitis C itself with a target of achieving seroconversion. Considering seroconversion is achieved in this case the diagnosis is unlikely to be one of these 3 options. Interferon therapy is known to cause focal segmental glomerulosclerosis with mainstay treatment being removal of offending agent.

**Further Reading**

An 58 year old man with longstanding gout is admitted with a further flare in his left knee which is effectively treated with aspiration and steroid injection. He only has one kidney as he is a kidney donor. He has had 3 attacks of gout in the last 4 months despite taking 600mg per day of allopurinol. He uses colchicine for acute attacks and takes Atenolol 50mg per day for hypertension. Recent investigations reveal the following:

| | | |
|---|---|---|
| **Creatinine** | 140 umol/L | (50-100) |
| **Uric Acid** | 520 umol/L | (110-420) |

Which of the following alternatives to allopurinol is the recommended next step in management?

- ○ Commence Benzbromarone
- ○ Commence long term low dose colchicine.
- ○ Commence long term oral steroids
- ○ Commence Probenecid
- ○ Commence Sulphinpyrazone

| | |
|---|---|
| Commence Benzbromarone ✔ Correct answer selected | 38% |
| Commence long term low dose colchicine. | 9% |
| Commence long term oral steroids | 14% |
| Commence Probenecid | 32% |
| Commence Sulphinpyrazone | 7% |

Recent guidance from the British Society of Rheumatology suggests that if a patient's gout is not adequately controlled on allopurinol and they have renal impairment then they should be switched to Benzbromarone. This drug needs to be carefully monitored as it is associated with liver function abnormalities.

Reference:


- Jordan KM, Cameron JS, Snaith M, Zhang W, Doherty M, Seckl J, Hingorani A,Jaques

A 55 year old man is seen on the acute medical ward with a month long history of fever, myalgia, arthralgia and abdominal discomfort. Examination reveals no synovitis but diffuse abdominal tenderness and a few scattered subcutaneous nodules. Urine dipstick is positive for blood and protein. Initial investigations are as follows:

| | | |
|---|---|---|
| **CRP** | 95 mg/dl | (<5) |
| **ESR** | 72 mm/hr | (0-10) |
| **WBC** | 13 x$10^9$/l | (4-11) |
| **Creatinine** | 135 umol/L | (50-100) |
| **ANA** | Negative | |

Which of the following is most likely to confirm the diagnosis in this patient?

- ANCA
- Renal and coeliac Angiography
- CT abdomen and pelvis
- Skin biopsy
- USS abdomen

ANCA 19%

Renal and coeliac Angiography 25%

✔ Correct answer selected

CT abdomen and pelvis 15%

Skin biopsy 41%

USS abdomen 1%

This patient presents with non specific features but diffuse abdominal pain and a positive urine dipstick with mild renal impairment. Although all the above investigations may be required to rule out other causes for these symptoms the main differential in this man is between Polyarteritis Nodosa (PAN) and Microscopic polyangiitis (MP). Although p-ANCA is usually positive in MP this is not always the case however the findings of aneuryms, segmental arterial narrowing and pruning of the peripheral vascular tree is seen in PAN but not MP making this the most likely test to confirm the diagnosis.

PAN is now divided into classical PAN and that associated with Hepatitis B infection. This distinction is important as management is different with Hepatitis B associated PAN being treated with antiviral agents and plasma exchange in addition to steroids in the first instance. Cyclophosphamide and steroid induction therapy remains the mainstay of treatment for non-Hepatitis B associated PAN.

A 70-year-old woman is found unconscious and is brought in to the Accident and Emergency unit. She attends alone with little information about her past medical history. On examination, her heart rate is 45 bpm and peripherally shut down. Her BP is 80/60 mmHg. An ECG confirms sinus rhythm with a rate of 45 bpm with changes consistent with inferior myocardial infarction.

Blood tests show:

| | | **Normal ranges** |
|---|---|---|
| **Sodium** | 137 mmol/L | 137–144 mmol/L |
| **Potassium** | 5.5 mmol/L | 3.5–4.9 mmol/L |
| **Bicarbonate** | 13 mmol/L | 20–28 mmol/L |
| **Chloride** | 106 mmol/L | 95–107 mmol/L |
| **Urea** | 7.5 mmol/L | 2.5–7.0 mmol/L |
| **Glucose** | 15.3 mmol/L | 3.0–6.0 mmol/L |

Which one of the following is the most probable cause for the blood picture seen?

- ○ Cardiac syncope
- ○ Diabetic ketoacidosis
- ○ Hypoglycaemic coma
- ○ Lactic acidosis

| | | |
|---|---|---|
| | Cardiac syncope | 19% |
| | Diabetic ketoacidosis ✖ Incorrect answer selected | 38% |
| | Hypoglycaemic coma | 0% |
| | Lactic acidosis ← Correct answer | 42% |
| | Stroke | 1% |

There is a high anion-gap metabolic acidosis in this scenario. In the context of myocardial infarction and hypotension there is a buildup of lactate (>2 mmol/l) due to tissue hypoperfusion - also known as a type A lactic acidosis. Correction of perfusion – by improving cardiac pumping or vascular circulation will reduce lactate and correct the metabolic acidosis. The glucose in this scenario is elevated, not because the patient has diabetes, but because it represents a stress response that accompanies cortisol release.

A 27 year old student who recently returned from a 2 week family vacation in Spain presents to Accident and Emergency with 3 episodes of bloody diarrhea and a decrease in urine output over the past 36 hours. There is no significant past history.

On examination, he remains afebrile with normal blood pressure and pulse rate. He appears pale with no other significant finding. His laboratory tests reveal:

| | | |
|---|---|---|
| Hb | 10.1 g/dl | 13-18 g/dl |
| WBC | 7.6 x $10^9$/l | 4-11 x $10^9$/l |
| Platelets | 70 x $10^9$/l | 150-300 x $10^9$ |
| PT | 12 seconds | 12-14 seconds |
| APTT | 34 seconds | 30-46 seconds |
| Creatinine | 287 umol/l | 50-120 umol/l |
| Urea | 66 mmol/l | 2.5-6.7 mmol/l |
| AST | 33 iu/ | 5-40 iu/l |
| ALT | 39 iu/l | 5-40 iu/l |
| LDH | 1100 iu/l | < 300 iu/l |
| Peripheral Film | Reveal multiple schistocytes | |

What is the most likely causative organism?

- ○ E. Coli 0157:H7
- ○ Rota virus
- ○ Salmonella typhi
- ○ Schistosoma mansoni
- ○ Vibrio cholera

E. Coli 0157:H7 ✔ Correct answer selected — 90%

Rota virus — 0%

Salmonella typhi — 2%

Schistosoma mansoni — 8%

Vibrio cholera — 0%

The presence of renal failure, thrombocytopenia and microangiopathic hemolytic anemia as evidenced by an elevated LDH and schistocytes points to a diagnosis of thrombotic microangiopathy. The absence of fever and neurological symptoms make “Hemolytic Uremic Syndrome” the likely diagnosis. Typical hemolytic uremic syndrome is associated with diarrhea, the most common causative organism of which is E. Coli 0157:H7.

A 50 year old man of Nigerian origin presents to Accident and Emergency with worsening of shortness of breath for the last 2 weeks and 2 episodes of hemoptysis this morning. He reports a decrease in urine output in the last 3 days as well. There is no history of fever, night sweats or weight loss. He has no significant medical history and is not on any regular medication. On examination, he has a pulse rate of 100/min, blood pressure of 180/100 mmHg and appears pale. He has bilateral pedal edema with raised JVP. Chest auscultation reveals bilateral lower zone pan-inspiratory crackles with bronchial breathing. His investigations reveal:

Hb: 7.5 g/dl

WBC: 13.6 x 109/l

Platelets: 455 x 109/l

PT/INR: Within limits

Urea: 23 mmol/l

Serum creatinine: 488 umol/l

CXR (PA view): Non-homogenous fluffy shadowing over lower zones bilaterally.

Urine Analysis:

Blood: +++

Protein:++++

Microscopy: RBC casts present

Urine Analysis:

Blood: +++

Protein:++++

Microscopy: RBC casts present

Lung Function Tests:

Increased Diffusion Gradient of Carbon Monoxide (DLCO) seen.

What is the most likely diagnosis?

- ○ Acute Kidney Injury
- ○ Churg Strauss syndrome
- ○ Community acquired pneumonia
- ○ Goodpasture's syndrome
- ○ Infective endocarditis

Goodpasture's syndrome ✔ 95%

Correct answer selected

Infective endocarditis 0%

Goodpasture's syndrome is renopulmonary syndrome characterised by lung hemorrhages and kidney dysfunction. Lung hemorrhages will manifest as infiltrates on chest X Ray and would show an increase in DLCO, as seen in this patient. Renal dysfunction classically manifests as a rapidly progressive glomerulonephritis with cellular crescents on renal histology. Antibodies against the basement membrane of glomeruli can be detected in serum to aid diagnosis. Mainstay treatment entails aggressive immunosuppression and plasmapheresis.

Further reading:

A 27 year old Caucasian lady presents to Accident & Emergency with severe headache and restlessness. Her blood pressure is found to be 210/110 mmHg. She is not known to be hypertensive previously but was started on amlodipine 10mg a few months ago by her rheumatologist to improve 'blood flow to her hands'. You notice microstomia and sclerodactyly.

Her blood work reveals:

| | | |
|---|---|---|
| Hb | 9.1 g/dl | 13-18 g/dl |
| WBC | 6.4 x $10^9$/l | 4-11 x $10^9$/l |
| Platelets | 99 x $10^9$/l | 150-300 x $10^9$/l |
| Urea | 16 mmol/l | 2.5-6.7 mmol/l |
| Creatinine | 118 mmol/l | 50-120 umol/l |
| Serum Sodium | 141 mmol/l | 135-145 mmol/l |
| Serum Potassium | 4.6 mmol/l | 3.5-5.0 mmol/l |

What is the drug of choice to control her blood pressure?

- ○ Intravenous hydralazine
- ○ Intravenous nitrates
- ○ Oral hydralazine
- ○ Oral lisinopril
- ○ Oral methyldopa

Intravenous hydralazine 25%

Intravenous nitrates 27%

Oral hydralazine 4%

Oral lisinopril ✔ Correct answer 43%

selected

Oral methyldopa 1%

Severe hypertension in the setting of a patient with systemic sclerosis as suggested by the sclerodactyly, Raynaud's and microstomia, should always raise the suspicion of "scleroderma renal crisis".

ACE inhibitors remain the mainstay treatment considering the hypertension is always hyperreninemic.

**Further Reading**

A 36-year-old male is referred in by the GP after presenting with headaches which have deteriorated over the last 2 weeks. He is found to have a high blood pressure of 220/120 mmHg and is admitted as an emergency. There is nothing particularly of note in his history. He is a non-smoker and drinks little alcohol. He does not take any drugs and denies illicit substance abuse.

On examination he has a BMI of 30.3 kg/m$^2$, a blood pressure of 224/122 mmHg and a pulse of 88 bpm. Examination of his fundi reveal some flame shaped haemorrhages. His ECG reveals left ventricular hypertrophy and urinalysis is negative.

Tests reveal:

| Test | Result | Normal range |
|---|---|---|
| Sodium | 141 mmol/l | 134-144 |
| Potassium | 3.5 mmol/l | 3.5-5 |
| Urea | 9.2 mmol/l | 3-8 |
| Creatinine | 110 micromol/l | 50-100 |

Which of the following is the most appropriate approach to the management of this patient?

- IV labetalol
- IV furosemide
- Oral amlodipine
- Oral ramipril
- Sublingual nifedipine

| | |
|---|---|
| IV labetalol ✔ Correct answer selected | 80% |
| IV furosemide | 0% |
| Oral amlodipine | 13% |
| Oral ramipril | 7% |
| Sublingual nifedipine | 0% |

Severe hypertension is classified as a systolic above 180 and a diastolic above 110 mmHg. Hypertensive crisis is associated with severe hypertension in the presence of end organ damage such as retinopathy; flame shaped haemorrhages and papilloedema; hypertensive encephalopathy; acute coronary syndrome; pulmonary oedema. This requires urgent treatment with the aim of reducing blood pressure by roughly 20-25%. IV drugs such as labetalol, nitroprusside (unlicensed), nicardipine and hydralazine can be used. In those with severe hypertension but lacking end organ damage, this is termed hypertensive urgency and oral antihypertensives can be employed.

Whilst nitroprusside is a potential answer here, it is not licensed for this use, is difficult to accurately titrate being very short acting, needs HDU monitoring, and with renal or hepatic failure can be associated with thiocyanate toxicity. Labetalol is the better answer.

A 45 year old Hispanic gentleman known to have diabetes and hypertension for the last 5 years presents to Accident and Emergency with an episode of generalized tonic clonic seizure. His wife is accompanying the him and she reports her husband to be unwell for the last 4-5 days with a low grade fever, shortness of breath and a decrease in urine output. He has been on metformin 500 mg BD, lisinopril 5mg OD, aspirin 75mg od and simvastatin 20mg daily with reasonable glycemic and blood pressure control.

On examination, he has a GCS of 14/15 with a blood pressure of 170/100 mmHg. Neurological examination is essentially unremarkable. His blood tests reveal:

| | | |
|---|---|---|
| Hb | 9.8 g/dl | 13-18 g/dl |
| WBC | $7.8 \times 10^9$ | $4\text{-}11 \times 10^9/l$ |
| Platelets | $46 \times 10^9/l$ | $150\text{-}300 \times 10^9/l$ |
| PT | 12 seconds | 12-14 seconds |
| APTT | 34 seconds | 30-46 seconds |

| | | |
|---|---|---|
| APTT | 34 seconds | 30-46 seconds |
| Blood glucose | 7.8 mmol/l | 2.5-7.5 mmol/l |
| Serum Urea | 102 mmol/l | 2.5-6.7 mmol/l |
| Serum Creatinine: | 456 umol/l | 50-120 umol/l |
| Serum Potassium: | 5.3 mmol/l | 3.5-5.0 mmol/l |
| LDH | 2100 iu/l | <300 iu/l |
| Peripheral Film | Fragmented RBCs | |
| ECG | Normal | |

What is the best management strategy for this patient?

- ○ Intravenous antibiotics
- ○ Intravenous bortezomib
- ○ Intravenous calcium gluconate
- ○ Intravenous chloroquine
- ○ Plasmapheresis

Peer responses

| | | |
|---|---|---|
| ○ | Intravenous antibiotics | 3% |
| ○ | Intravenous bortezomib | 1% |
| ○ | Intravenous calcium gluconate | 1% |
| ○ | Intravenous chloroquine | 3% |
| ● | Plasmapheresis ✔ Correct answer selected | 92% |

The presence of renal failure, thrombocytopenia and microangiopathic hemolytic anemia as evidenced by an elevated LDH and schistocytes points to a diagnosis of thrombotic microangiopathy. The presence of fever and neurological symptoms make “Thrombotic Thrombocytopenic Purpura” the likely diagnosis. The mainstay of treatment is plasmapheresis.

**Further Reading**

An 85 year old man is admitted from a nursing home because of disorientation. The carer accompanying the gentleman reports that the patient had gradually become withdrawn over the past 2 days when he developed a low grade fever, accompanied by a dry cough, until he became totally disoriented this morning. He is known to suffer from congestive heart disease, for which he takes spironolactone and furosemide, along with bisoprolol and losartan for his hypertension.

On examination, he has a temperature of 38 degree celsius, a pulse of 100/minute and a blood pressure of 136/70 mmHg. He does not have any pedal edema, although his mucous membranes appear dry with poor skin turgor. His chest examination reveals coarse pan-inspiratory crackles with increased vocal fremitus over the right lower hemithorax. No focal neurological deficit could be ascertained.

Investigations reveal:

| | | |
|---|---|---|
| Hb | 14.1 g/dl | 13-18 g/dl |
| WBC | 13.6 x $10^9$/l | 4-11 x $10^9$/l |

| | | |
|---|---|---|
| | | g/dl |
| WBC | 13.6 x $10^9$/l | 4-11 x $10^9$/l |
| Platelets | 369 x $10^9$/l | 150-300 x $10^9$/l |
| Serum Sodium | 116 mmol/l | 135-146 mmol/l |
| Serum Potassium | 5.0 mmol/l | 3.5-5.0 mmol/l |
| Serum Urea | 8 mmol/l | 2.5-6.7 mmol/l |
| Serum Creatinine | 88 umol/ | 50-120 umol/l |
| CRP | 54 mg/l | <5.0 mg/l |
| CXR PA View | ight Lower Zone Homogenous Opacity with air bronchogram | |

What is the most likely cause of his hyponatremia?

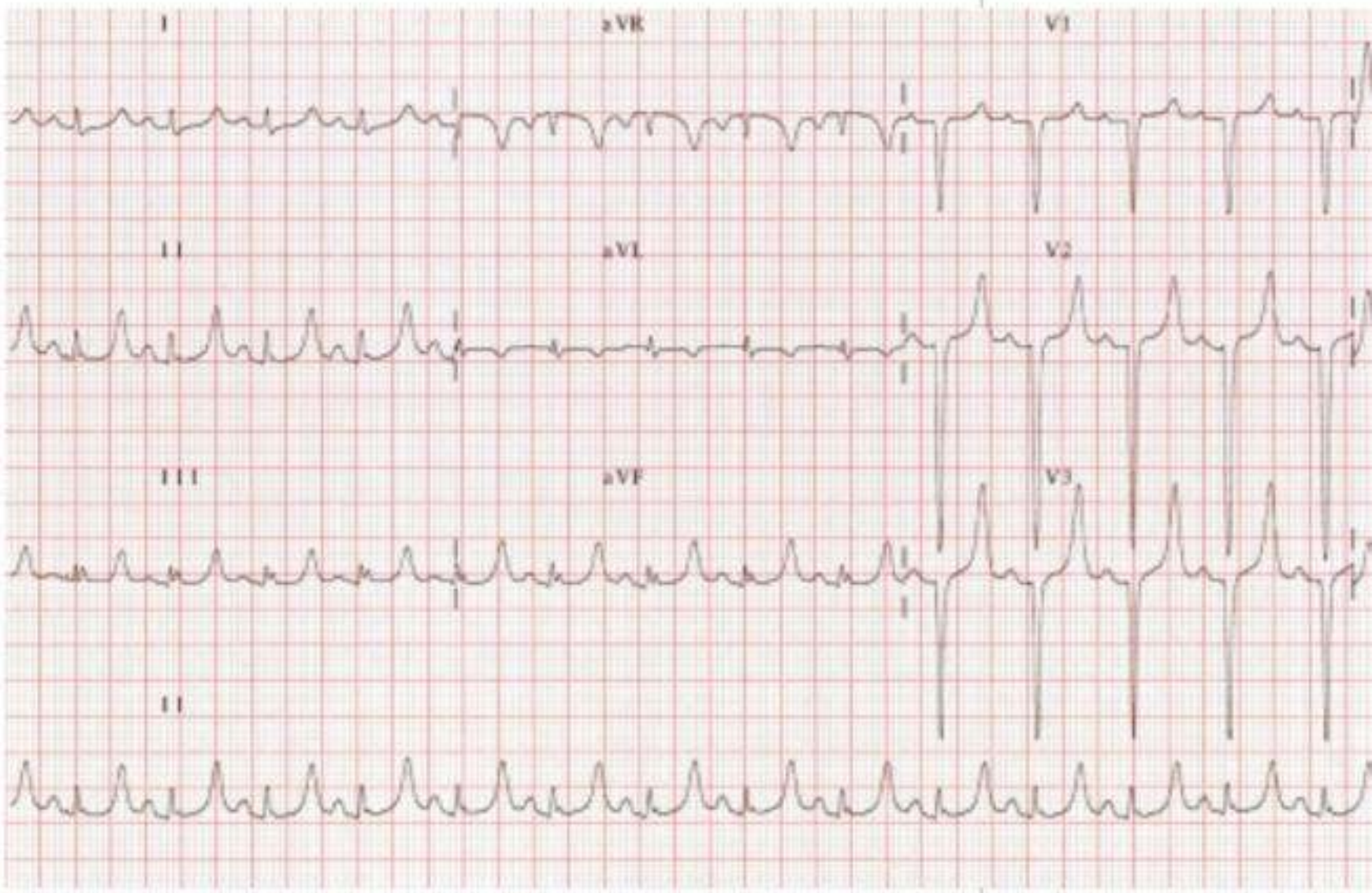
- ○ Cerebral salt wasting syndrome
- ○ Congestive heart failure
- ○ Diuretic therapy
- ○ Hypocortisolism
- ○ Syndrome of inappropriate ADH secretion

| | |
|---|---|
| Congestive heart failure | 2% |
| Diuretic therapy ← Correct answer | 31% |
| Hypocortisolism | 7% |
| Syndrome of inappropriate ADH secretion ✖ Incorrect answer selected | 51% |

It is important to note that this patient is dehydrated, hence hypovolaemic hyponatraemia, which narrows the diagnosis down to either cerebral salt wasting syndrome or diuretics. The absence of any history of cerebral insult rules out cerebral salt wasting, leaving diuretics to be the answer. A diagnosis of hyponatremia in hypocortisolism or syndrome of inappropriate ADH secretion is made in euvolemic patients. Patients with congestive heart failure and hyponatremia are volume overloaded.

Question ID #3780

This is the ECG obtained on a 77 year old man with type 2 diabetes who was admitted with lethargy and tiredness.




What does the ECG suggest?

- ○ Hypercalcaemia
- ○ Hyperkalaemia
- ○ Hypocalcaemia
- ○ Hypokalaemia
- ○ Hypothermia

Hyperkalaemia ✔ Correct 94%

answer selected

Hypocalcaemia 1%

Hypokalaemia 1%

Hypothermia 2%

This ECG shows tented T waves and p waves with a tachycardia suggestive of hyperkalaemia.

A 62 year old lady who received a cadaveric renal transplant 5 months ago presents to Accident and Emergency with a feeling of general malaise and persistent diarrhea. Her current medications include oral prednisolone 7.5 mg OD, tacrolimus 2mg BD, mycophenolate mofetil 500mg BD, carvedilol 6.25mg BD, metformin 500mg BD and aspirin 75mg OD.

On examination, she has a low grade fever and appears icteric and slightly dehydrated with a blood pressure of 134/72 mmHg and pulse of 80 bpm. The rest of the examination is normal. Her laboratory investigations reveal:

| | | |
|---|---|---|
| Hb | 13.5 g/dl | 12-18 g/dl |
| WBC | 7.9 x $10^9$/l | 4-11 x $10^9$/l |
| Platelets | 325 x $10^9$/l | 150-300 x $10^9$/l |
| PT | 12 seconds | 12-14 Seconds |
| APTT | 34 seconds | 30-46 seconds |
| Serum creatinine | 130 umol/l | 50-120 umol/l |
| Urea | 18 mmol/l | 2.5-6.7 mmol/l |
| ALT | 100 iu/l | 5-40 iu/l |
| AST | 111 iu/l | 5-40 iu/l |
| Total bilirubin | 26 umol/l | 2-17 umol/l |
| GGT | 10 u/l | 5-30 u/l |

What is the most likely diagnosis?

- ○ BK virus nephropathy
- ○ Cytomegalovirus disease
- ○ Leptospirosis
- ○ Miliary tuberculosis
- ○ Posttransplant lymphoproliferative

BK virus nephropathy 7%

Cytomegalovirus disease ✔ 81%

Correct answer selected

Leptospirosis 5%

Miliary tuberculosis 0%

Posttransplant lymphoproliferative disease 7%

The most common time for opportunistic infections to occur secondary to immunosuppression is the 1-6 month period post-transplant, as encountered with this patient. CMV infection pneumocystis is an opportunistic systemic infection with varied presentations ranging from colitis and hepatitis to pneumonitis. Diagnostic investigations include DNA polymerase chain reaction assays, antibody assays and organ specific procedures like colonoscopy etc.

## What is the BK virus in kidney?

Nephropathy from **BK virus** (BKV) infection is an evolving challenge in **kidney** transplant recipients. It is the consequence of modern potent immunosuppression aimed at reducing acute rejection and improving allograft survival. Untreated BKV infections lead to **kidney** allograft dysfunction or loss.

A 72 year old man with a 12 year history of diabetes being treated with metformin attends as a GP admission, as he is lethargic and the GP is concerned about his persistent hyperkalaemia. His HbA1c 7.5% (<6). He also has a history of hypertension for which he takes bisoprolol 5 mg daily, amlodipine 10 mg/d, simvastatin 40mg/d and aspirin 75 mg/d.

He has been re-referred to clinic by his GP as he has been noted to have a persistent hyperkalaemia. Previously he was taking an ACE inhibitor but this was stopped one year ago.

| | |
|---|---|
| Sodium | 132 mmol/l (134-144) |
| Potassium | 5.8 mmol/l (3.5 – 5) |
| Urea | 8.8 mmol/l (3-8) |
| Creatinine | 100 micromol/l (50-100) |
| Glucose | 14.1 mmol/l (3.5-5.5) |

Which of the following is the likely cause of this man's hyperkalaemia?

- ○ Auto-immune hypoadrenalism
- ○ Bisoprolol
- ○ Chronic renal failure
- ○ Metformin
- ○ Renal artery stenosis

| | |
|---|---|
| Auto-immune hypoadrenalism | 50% |
| Bisoprolol ← Correct answer | 11% |
| Chronic renal failure ✖ | 14% |
| Incorrect answer selected | |
| Metformin | 8% |
| Renal artery stenosis | 18% |

This patient has a long history of hypertension and hyperkalaemia. He has a mild hyponatraemia associated with the hyperkalaemia and the most likely diagnosis is type 4 renal tubular acidosis or hyporeninaemic hypoaldosteronism. The most likely drug to cause this is the beta blocker and this should be stopped. Other drugs implicated include ACE inhibitors and NSAIDs. At this age and in a patient that does not have other autoimmune disease (T2DM), this is unlikely to be hypoadrenalism

A 56 year old gentleman known to have adult polycystic kidney disease presents to Accident and Emergency with complaints of pain in the left flank, fever, pyuria and dysuria. He regularly takes lisinopril 5 mg to control his hypertension.

On examination, he remains febrile with a temperature of 39 degree celsius, a pulse rate of 100/minute and a blood pressure controlled at 120/80 mmHg. He has tenderness over his left flank with both kidneys manually palpable. He has no other visceromegaly and has normal bowel sounds. You suspect a urine infection and get the following test results:

| | | |
|---|---|---|
| Hb | 13.4 g/dl | 13-18 g/dl |
| WBC | 14.7 x $10^9$/l | 4-11 x $10^9$/l |
| Platelets | 316 x $10^9$/ | 150-300 x $10^{9/l}$ |
| PT | 12 seconds | 12-14 seconds |
| APTT | 34 seconds | 30-46 seconds |
| Serum Creatinine | 89 mmol/l | 50-120 umol/l |

| | | |
|---|---|---|
| Serum Creatinine | 89 mmol/l | 50-120 umol/l |
| S/Urea | 7 mmol/l | 2.5-6.7 mmol/l |
| CRP | 45 mg/l | <5 mg/l |

Urine Analysis:

| | |
|---|---|
| Pus Cells | Numerous |
| Leucocyte Esterase | +++ |
| Blood | ++ |

Which of the group of antibiotics can be started empirically by virtue of excellent cyst penetration?

- ○ Amoxicillin & metronidazole
- ○ Chloramphenicol & cefuroxime
- ○ Ciprofloxacin & co-trimoxazole
- ○ Gentamycin & cefixime
- ○ Vancomycin & linezolid

Amoxicillin & metronidazole 4%

Chloramphenicol & cefuroxime 5%

Ciprofloxacin & co-trimoxazole 48%

✔ Correct answer selected

Gentamycin & cefixime 37%

Vancomycin & linezolid 5%

Fluoroquinolones and cotrimoxazole are known to cross the cyst membranes. They cover the most commonly encountered bacteria in such scenarios i.e. E.coli, proteus, klebsiella and other enterobacteriaceae species. Cyst aspiration to culture the organism remains gold standard.

A 35-year-old woman has a history of recurrent urinary tract infections. She attends accident and emergency with severe left sided flank pain. Dipstick urine shows blood 2+ protein 1+.

Bloods show:

| | | Normal ranges |
|---|---|---|
| **Sodium** | 137 mmol/L | 137–144 mmol/L |
| **Potassium** | 2.3 mmol/L | 3.5–4.9 mmol/L |
| **Bicarbonate** | 13 mmol/L | 20–28 mmol/L |
| **Chloride** | 116 mmol/L | 95–107 mmol/L |
| **Urea** | 3.6 mmol/L | 2.5–7.0 mmol/L |
| **Urinary pH** | 6.6 | |

Which one of the following is the most probable diagnosis in this case?

- ○ Chronic renal failure
- ○ Type-I renal tubular acidosis
- ○ Type-II renal tubular acidosis
- ○ Type-IV renal tubular acidosis
- ○ Ureteric stone

Chronic renal failure 0%

Type-I renal tubular acidosis ✔ 38%

Correct answer selected

Type-II renal tubular acidosis 40%

Type-IV renal tubular acidosis 15%

Ureteric stone 7%

The biochemical picture is consistent with distal renal tubular acidosis (type-I renal tubular acidosis). This includes an acidosis, hypokalaemia, low serum bicarbonate levels and relatively high urinary pH. Urine pH remains >5.5 despite severe acidaemia ([$HCO_3$] <15 mmol/l). Renal stone formation and nephrocalcinosis are common in this condition.

You are asked to review a 40 year old Asian gentleman urgently in the Acute Hemodialysis Unit. You are informed by the duty nurses that the patient developed an episode of tonic clonic seizures 2 hours into his dialysis session. On reviewing his medical notes you notice that he had been advised arterio-venous fistula and dialysis 6 months ago, which he had refused and had travelled back to India.

You also note that this is his first session of hemodialysis with the following dialysis orders:

| | |
|---|---|
| Dialysis session duration | 4 hours |
| Blood flow | 350 ml/min |
| Dialysate flow | 500 ml/min |
| Anticoagulation use | Low heparin protocol |

On examination, he appears significantly emaciated with a blood pressure of 110/70 mmHg, a pulse rate of 96/minute and a temperature of 38 degree celsius. He remains unconscious with a GCS of 8/15. There is no focal neurological deficit with bilateral reactive pupils and bilateral downgoing plantar reflexes. His laboratory investigations show:

| | | |
|---|---|---|
| Hb | 11.1 g/dl | 12-18 g/dl |
| WBC | 7.6 x $10^9$/l | 4-11 x $10^9$/l |
| Platelets | 366 x $10^9$/l | 150-300 x $10^9$/l |
| PT | 12 seconds | 12-14 seconds |
| APTT | 34 seconds | 30-46 seconds |
| Serum Creatinine | 892 umol/l | 50-120 umol/l |
| Urea | 135 mmol/l | 2.5-6.7 mmol/l |
| ECG | Unremarkable | |

What is the most likely diagnosis?

- ○ Acute coronary syndrome
- ○ Cerebral salt wasting syndrome
- ○ Dialysis disequilibrium syndrome
- ○ Hemorrhagic stroke
- ○ Ischemic stroke

Acute coronary syndrome 1%

Cerebral salt wasting syndrome 4%

Dialysis disequilibrium syndrome 94%

✔ Correct answer selected

Hemorrhagic stroke 1%

Ischemic stroke 1%

Patients with severe azotemia are recommended to have short, more frequent dialysis sessions with a lower blood flow setting for the first few sessions of hemodialysis. This is to prevent transient osmotic disequilibrium known as "dialysis disequilibrium syndrome", which may manifest with neurological symptoms like restlessness, headache, twitching, tremors or even seizures as in this case.

A 49 year old woman is admitted with a 3 day history of left flank pain, dysuria and fever. She has an 8 year history of type 2 diabetes for which she takes metformin and gliclazide together with Ramipril and simvastatin.

On examination her BMI is 35.3 kg/$m^2$, temperature is 38.5C, pulse 92 bpm and blood pressure 120/80 mmHg. She has oxygen sats of 97% on air and a respiratory rate of 22/min. She has some tenderness on the left flank but no masses are palpable.

Results show:

| | |
|---|---|
| Sodium | 136 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 12.1 mmol/l (3-8) |
| Creatinine | 128 micromol/l (50-100) |
| Haemoglobin | 13.3 g/l (120-160) |
| White cell Count | 12.8 x$10^9$/l (3-10) |
| Platelets | 158 x$10^9$/l (140-450) |
| C-Reactive Protein | 135 mg/dl (<5) |
| Glucose | 12.3 mmol/l |
| HbA1c | 7.8% (<6) |
| Urinalysis | Red cells ++, leucocytes ++ |

Which of the following is the most appropriate treatment for this woman?

- ○ IV amoxicillin
- ○ IV cefuroxime
- ○ Oral co-amoxiclav
- ○ Oral nitrofurantoin
- ○ Oral trimethoprim

IV cefuroxime ✔ Correct 48%

answer selected

Oral co-amoxiclav 18%

Oral nitrofurantoin 9%

Oral trimethoprim 7%

This woman is likely to have urosepsis, as illustrated by evidence of infection plus temperature (>38.3), WCC (<4 or >12), heart rate (>90) and respiratory rate (>20). The most common organism is E Coli and therefore the most appropriate treatment is IV antibiotics Cefuroxime or Piperacillin/Tazobactam or ciprofloxacin

A 42 year old male with schizophrenia complains of cough and night sweats for 3/52. No improvement was observed after a 1/52 Amoxicillin from the GP so his carers bring him to A&E. Clinical examination is consistent with consolidation and a pleural effusion at the right base. His temperature is 37.4C and his oxygen saturations are 95% on air. CXR confirms right lower and midzone pneumonia with a moderate right pleural effusion. A diagnostic pleural tap was undertaken with blood stained fluid extracted.

Analysis of pleural fluid revealed:

| | |
|---|---|
| pH | 6.9 |
| Glucose | 1.0 mmol/l (Normal >3.4 mmol/l) |
| Protein | 50 g/l (<20) |
| LDH | 5467 iu/l (<100) |

The most likely diagnosis and management is?

- ○ Complicated effusion requires 12 F chest drain
- ○ Complicated effusion requires observation only
- ○ Complicated effusion requires wide bore chest drain
- ○ Empyema requires 12 F chest drain
- ○ Empyema requires wide bore chest drain

Complicated effusion requires 12 F chest drain ← Correct answer — 16%

Complicated effusion requires observation only — 2%

Complicated effusion requires wide bore chest drain — 5%

Empyema requires 12 F chest drain — 43%

Empyema requires wide bore chest drain ✖ Incorrect answer selected — 35%

There is no pus in the fluid so by definition this is not an empyema. As the pH is <7.2, LDH >1000 and glucose is low this is a complicated parapneumonic effusion and BTS guidance recommends drainage with a 12 F chest drain. Note empyemas do not always require a wide bore drain and 12 F chest drains are being increasingly used here.

**Further Reading**

- BTS Pleural Disease Guideline 2010

StudyPRN

# Acute Medicine SCE Revision Respiratory medicine

A 71-year-old male presents to his GP with a 3-month history of weight loss, cough and malaise. He has a 50-pack year smoking history. His GP organises a number of investigations including a chest X-ray that shows a left upper lobe mass. Some key blood test results are as follows:

| | |
|---|---|
| Haemoglobin | 14.9 g/dl (12-16) |
| White Blood Count | 6.3 (4-10) |
| Corrected Calcium | 2.58 mmol/l (2.2-2.6) |
| Potassium | 3.1 mmol/l (3.5-5) |
| Sodium | 125 mmol/l (134-144) |

Based on the investigations, what is the most likely diagnosis?

- ○ Adenocarcinoma of the lung
- ○ Large cell lung carcinoma
- ○ Small cell lung cancer
- ○ Squamous cell lung cancer
- ○ Tuberculosis

| | | |
|---|---|---|
| ○ | Large cell lung carcinoma | 1% |
| ○ | Small cell lung cancer ✔ | 64% |
| | Correct answer selected | |
| ○ | Squamous cell lung cancer | 21% |
| ○ | Tuberculosis | 2% |

This patient has symptoms of an underlying lung cancer, supported by the mass on X-ray. His blood picture demonstrates a neuroendocrine syndrome, namely syndrome of inappropriate ADH secretion (SIADH). SIADH is most commonly associated with small cell lung cancer. Squamous cell lung cancer is more commonly associated with hypercalcaemia, whilst adenocarcinoma and large cell carcinoma are not as commonly associated with the neuroendocrine syndromes.

Although TB can present with the symptoms described, given the history and key findings, it is important to exclude a lung cancer first in this patient.

A 73 year old man is admitted to the MAU by his GP with a 5 day history of cough and feeling unwell. He has otherwise been well with no other history of note. His cough is productive of a greenish sputum and he has become increasingly breathless. He is a non-smoker. He informs you that he has a penicillin allergy. Otherwise he does not take any medication.

On examination, he has a BMI of 28.5 kg/m2, a pulse of 82 bpm regular, a blood pressure of 122/88 mmHg and oxygen saturations on air of 95%. His temperature is 38.5C. Auscultation of the heart is normal and examination of the chest reveals some crackles at the right base.

His results reveal:

| | |
|---|---|
| Sodium | 136 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 6.8 mmol/l (3-8) |
| Creatinine | 98 micromol/l (50-100) |
| Haemoglobin | 13.3 g/l (120-160) |
| White cell Count | $12.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |

A 73 year old man is admitted to the MAU by his GP with a 5 day history of cough and feeling unwell. He has otherwise been well with no other history of note. His cough is productive of a greenish sputum and he has become increasingly breathless. He is a non-smoker. He informs you that he has a penicillin allergy. Otherwise he does not take any medication.

On examination, he has a BMI of 28.5 kg/m2, a pulse of 82 bpm regular, a blood pressure of 122/88 mmHg and oxygen saturations on air of 95%. His temperature is 38.5C. Auscultation of the heart is normal and examination of the chest reveals some crackles at the right base.

His results reveal:

| | |
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| Sodium | 136 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 6.8 mmol/l (3-8) |
| Creatinine | 98 micromol/l (50-100) |
| Haemoglobin | 13.3 g/l (120-160) |
| White cell Count | $12.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |

| | |
|---|---|
| Haemoglobin | 13.3 g/l (120-160) |
| White cell Count | $12.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |
| C-Reactive Protein | 55 mg/dl (<5) |

The chest x-ray reveals some haziness at the right base.

Which of the following is the most appropriate treatment for this patient?

- IV cefotaxime
- IV clarithromycin
- Oral amoxicillin
- Oral doxycycline
- Oral levofloxacin

A 34-year-old man, with no significant past medical history and who is a non-smoker, presents with acute onset chest pain on the right side and is found to have a pneumothorax on chest X-ray. The chest X-ray is otherwise unremarkable. On measurement it is found to be approximately 1 cm from the lung margin to the chest wall at the level of the hilum.

The patient's observations are as follows:

| Test | Result | Normal ranges |
|---|---|---|
| Temperature | 36°C | 36.1°-37.2°C |
| Respiratory rate | 22 breaths/min | 16–20 breaths/min |
| Heart rate | 110 bpm | 50–80 bpm |
| Blood pressure | 110/50 mmHg | 120/80 mmHg |
| Oxygen saturations on air | 98% | 95 to 100% |

What is the next step?

- ○ Admit for 7 days and observe for progression
- ○ Chest drain
- ○ Discharge and return in 2-4 weeks
- ○ Immediate referral to cardiothoracic surgeon
- ○ Needle aspiration

Oral amoxicillin 20%

Oral doxycycline ✔ Correct 40%

answer selected

Oral levofloxacin 36%

This patient has a community acquired pneumonia but is allergic to penicillin and therefore, according to guidance, could be treated with oral non-penicillin alternatives such as doxycycline or clarithromycin.

Chest drain 1%

Discharge and return in 2-4 weeks ✔ Correct answer selected 61%

Immediate referral to cardiothoracic surgeon 1%

Needle aspiration 36%

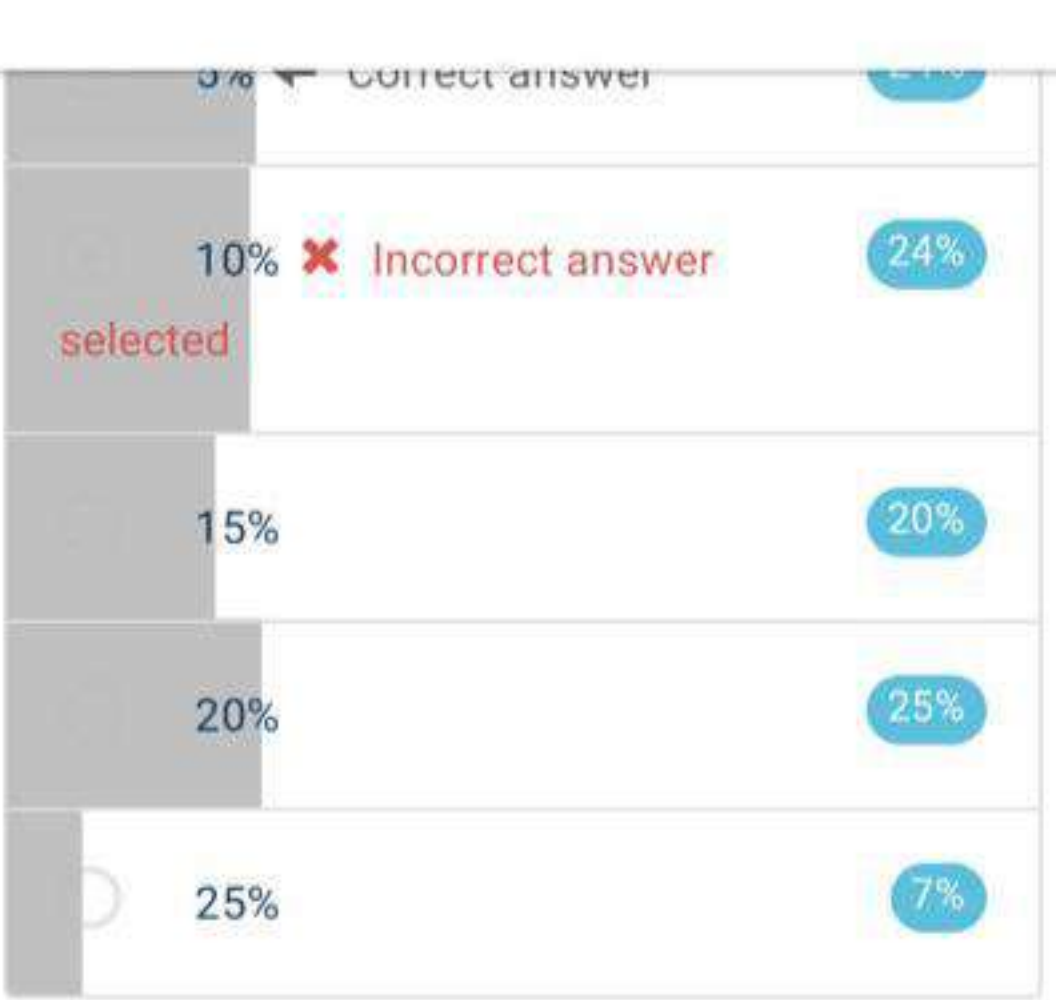
**Explanation**

The British Thoracic Society (BTS) definition of a 'large' pneumothorax is a >2 cm measurement from the lung margin to the chest wall at the level of the hilum. This patient has primary spontaneous pneumothorax (PSP), is less than 50 years old and is a non-smoker and there is no evidence of underlying lung disease on examination or chest x-ray. Conservative management is the treatment of choice for a small PSP without significant breathlessness and in the absence of a persistent air leak. The PSP will gradually resolve as air is reabsorbed into the pulmonary capillaries. Patients with a small PSP without breathlessness should be considered for discharge with an early outpatient review in 2-4 weeks. These patients should also receive clear written advice to return in the event of worsening breathlessness. Supplemental high flow oxygen is recommended when patients are admitted for observation.

A 78-year-old lady with COPD is referred to the Rapid Access Chest clinic with a 5-month history of cough and weight loss. A chest X-ray requested by the GP demonstrated a lesion within the left lower lobe. A CT confirmed a likely lung primary with TNM staging T3N2M0 and biopsy shows a non-small cell lung cancer, likely squamous cell. She is referred to the oncologists for consideration of radiotherapy..

Currently, in the UK, what is the 10-year survival for lung cancer?

- 5%
- 10%
- 15%
- 20%
- 25%




Currently around 5% of lung cancers are cured, and although the cure rate is slowly improving it lags behind most other common cancers. Outcomes in the UK are worse than in a number of other European countries and North America. The 1-year survival is 30%. An individual's prognosis will depend on a number of variables including stage at diagnosis, histological subtype, comorbidities and performance status at diagnosis (which will also influence management options).

A 42 year old woman presents acutely complaining of a left sided pleuritic chest pain of 4 hours duration and a painful cough. She had a recent upper respiratory tract infection having had a cough and sniffles for 3-4 days. In her past, she was diagnosed with ulcerative colitis maintained in remission on mesalazine. She is a non-smoker.

On examination, her pulse is 110 bpm, blood pressure 100/60 mmHg, respiratory rate 22/min with oxygen saturations of 94% on room air. Her temperature is 37.2C and her chest is clear.

Investigations reveal:

| | |
|---|---|
| **FBC** | Normal |
| **CRP** | 20 mg/dl (<5) |
| **U+E** | Normal |
| **ECG** | Normal |

Which of the following is the most appropriate next investigation for this patient?

- ○ CTPA
- ○ D-dimer
- ○ Echo
- ○ No need for further investigation as likely viral pleurisy
- ○ VQ scan

| | | |
|---|---|---|
| CTPA ✖ Incorrect answer selected | | 34% |
| D-dimer ← Correct answer | | 50% |
| Echo | | 0% |
| No need for further investigation as likely viral pleurisy | | 14% |
| VQ scan | | 2% |

This patient presents with acute breathlessness and chest pain. She has a tachycardia and her oxygen saturations are low. We are not told whether she has a previous PE/DVT and so must assume that she has not. Therefore, her Well's score here would be 3, as a diagnosis of PE is a distinct possibility here and so the algorithm would suggest the measurement of a D-Dimer in the first instance and if positive to undertake imaging, most probably CTPA. D-dimer will be positive in about 98% of cases of PE and so if negative would suggest the end of the pathway and no further imaging required.

Suspected PE Pathway

A 37 year old lady who had a cadaveric renal transplant 5 months ago presents to Accident and Emergency with complaints of fever, dry cough and worsening of shortness of breath over the last 4 days. She is known to have Alport's syndrome and has remained on peritoneal dialysis for 1 year. Her current medications include oral prednisolone, mycophenolate mofetil, tacrolimus, lisinopril and omeprazole.

On examination, she appears short of breath with a respiratory rate of 26/min and an oxygen saturation of 90% on 2 liters of oxygen. Her blood pressure is 140/90 mmHg with a temperature of 38°C. There is no pallor or pedal edema. Her chest auscultation reveals bilateral pan inspiratory coarse crackles. The rest of the examination is unremarkable.

Her investigations reveal:

| | | |
|---|---|---|
| Hb | 12.3 g/dl | 13-18 g/dl |
| WBC | 13.6 x $10^9$/l | 4-11 x $10^9$/l |
| Platelets | 133 x $10^9$/l | 150-300 x $10^9$/l |

| | | |
|---|---|---|
| | | g/dl |
| WBC | 13.6 x $10^9$/l | 4-11 x $10^9$/l |
| Platelets | 133 x $10^9$/l | 150-300 x $10^9$/l |
| PT | 12 seconds | 12-14 seconds |
| APTT | 34 seconds | 30-46 seconds |
| S/Creatinine | 234 micromol/l | 50-120 umol/l |
| S/Urea | 66 mmol/l | 2.5-6.7 mmol/l |
| ALT | 47 iu/l | 5-40 iu/l |
| LDH | 365 iu/l | <300iu/l |
| CXR (PA View) | Bilateral Hilar & Lower Zone Non-Homogenous Opacities | |

What is the most likely diagnosis?

- ○ Aspergillosis
- ○ Community acquired pneumonia
- ○ Pneumocystis jiroveci pneumonia
- ○ Pulmonary tuberculosis
- ○ Sarcoidosis

Aspergillosis 12%

Community acquired pneumonia 4%

Pneumocystis jiroveci pneumonia ✔ Correct answer selected 77%

Pulmonary tuberculosis 6%

Sarcoidosis 1%

This patient with renal transplantation has now become acutely unwell with fever and chest infection. The timing of an infectious episode after transplantation is crucial in establishing a diagnosis. In the first one month after transplantation, usually infections related to the surgery itself or indwelling catheters like urinary tract infections are common. Whereas the most common time for opportunistic infections to occur secondary to immunosuppression is the 1-6 month period post-transplant, as encountered with this patient. Pneumocystis jiroveci pneumonia (PCP) is an opportunistic chest infection with the patient presenting with nonspecific pneumonic symptoms like cough (often dry), fever, shortness of breath and occasionally hemoptysis. 2 main differentiating points between PCP and community acquired pneumonia remain the chest X ray findings and an elevated LDH in case of PCP. The chest X ray although normal in mild disease usually yields peri-hilar bilateral middle-lower zone infiltrates in PCP. Bronchoalveolar lavage remains the mainstay diagnostic modality with co-trimoxazole being the first line treatment.

**Reference**

Ufone 9:47 AM @ 57%
studyprn.com

A 65-year-old man presents to A+E with a 2 day history of fever, lethargy and dysuria. He has become confused in the hours prior to admission and drowsy. He is diagnosed with urinary sepsis with associated acute kidney injury, and he is commenced on appropriate antibiotics and IV fluids.

22 hours after admission he becomes increasingly breathless as reviewed by the oncall team.

He is only managing to complete short sentences. He has dry mucous membranes. His respiratory rate is 30, heart rate is 121bpm, BP is 105/64, oxygen saturations are 92% on 15L. Examination shows normal JVP and normal heart sounds. Auscultation reveals fine crackles bilaterally. There is no peripheral oedema and his calves are soft and non-tender. He is passing urine and is 400ml positive balance since admission.

A chest x-ray demonstrated bilateral infiltrates.

A blood gas is also performed on 15L (via non-rebreather mask).

| | |
|---|---|
| **pH** | 7.32 |
| **pCO2** | 3.8 kPa |
| **pO2** | 8.1 kPa |
| **HCO3** | 18.7mmol/l |

What is the most likely explanation for his deterioration?

- ○ Acute pulmonary oedema
- ○ Acute respiratory distress syndrome
- ○ Hospital acquired pneumonia
- ○ Pulmonary embolism
- ○ Pulmonary haemorrhage

Acute respiratory distress syndrome ✔ Correct answer selected — 69%

Hospital acquired pneumonia — 4%

Pulmonary embolism — 10%

Pulmonary haemorrhage — 3%

In the context of sepsis, the most likely explanation of this patient's current condition is ARDS. Although he has received IV fluids as part of his treatment for sepsis, he is only mildly in positive balance and it is likely he was in a profound 'negative balance' on admission; there is no evidence clinically that he is overloaded. Whilst he is at risk of pneumonia, the rapid deterioration chest x-ray findings are more in keeping with ARDS than pneumonia, and a HAP this early on would be unusual.

ARDS is an acute injury to the lungs brought about by a variety of insults, that causes widespread inflammation and impedes gas exchange at the alveolar level.

inflammation and impedes gas exchange at the alveolar level.

Direct pulmonary causes include inhalation of gastric contents (pH <2), infective (pneumonia, etc), pulmonary trauma, near-drowning, toxic gas inhalation and oxygen toxicity.

Indirect causes include sepsis, non-thoracic trauma, uraemia, bowel infarction, anaphylaxis and burns.

The diagnostic criteria include:

- An acute lung injury - within one week of the insult
- Bilateral infiltrates on a chest x-ray, not explained by other lung pathology
- Respiratory failure not explained by fluid overload
- A Decreased PaO2/FiO2 ratio

ARDS mortality is generally high (40%), but is determined by the cause with aspiration pneumonia having a mortality rate of almost 80% when associated with ARDS.

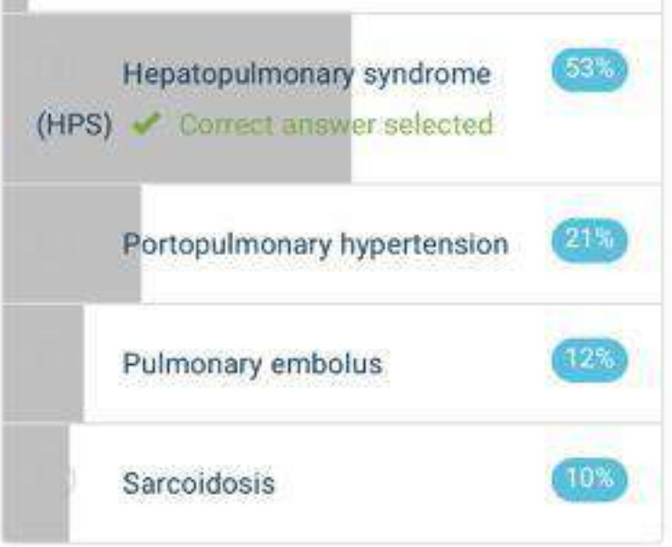
**Reference:**

A 55-year-old Afro-Caribbean woman with cryptogenic cirrhosis notes progressive exertional dyspnea, despite being fully compliant with a salt-restricted diet and a high-dose diuretic medication regimen.

Her saturations are 92% while sitting and 88% when standing. The results of her cardiac and respiratory system examinations are normal, she has minimal ascites and trace ankle edema, and her weight has been stable over the past several months.

Which of the following is the most likely diagnosis?

- Hepatic hydrothorax
- Hepatopulmonary syndrome (HPS)
- Portopulmonary hypertension
- Pulmonary embolus
- Sarcoidosis




Cirrhotic patients are at increased risk of specific abnormalities of pulmonary mechanics, haemodynamics, and ventilation-perfusion matching that can adversely affect both quality of life and longevity. Two of the most common pulmonary manifestations of cirrhosis are alterations in lung mechanics caused by the presence of ascites and intrapulmonary shunting and abnormal gas exchange, which together constitute HPS. HPS is defined as a widened age-corrected alveolar-arterial oxygen gradient (AaPO2) of room air in the presence or absence of hypoxemia (AaPO2 >15 mm Hg or >20 mm Hg in patients older than 64 years of age) as a result of intrapulmonary vasodilation.

Classic clinical manifestations of HPS include platypnea (dyspnea worsened by an erect position and improved by a supine position), orthodeoxia (exacerbation of hypoxia and hypoxemia in the upright position), an insidious onset and slow progression of dyspnea, clubbing, and distal cyanosis.

The diagnosis of HPS requires a high degree of clinical suspicion, measurement of arterial blood gases, detection of intrapulmonary shunting, and exclusion of intrinsic cardiopulmonary disease as the cause of hypoxemia.

The most sensitive test for the diagnosis of intrapulmonary shunting is contrast echocardiography. Treatment options for HPS are limited. Patients with well-preserved hepatic synthetic function who have hypoxemia are generally treated symptomatically until oxygenation worsens sufficiently to permit listing for liver transplantation.

A 39 year old man attends A&E with supraventricular tachycardia. He has never had it before, but feels well other than having severe palpitations. His ECG confirms SVT at a rate of 190 bpm. His only medical history is that of asthma, which has required intensive care admission in the past.

After chemically cardioverting him with adenosine he develops bronchospasm, and becomes very wheezy.

Which of the following is an indicator of life threatening asthma?

- ○ Heart rate <110 bpm
- ○ Inability to complete sentences in one breath
- ○ Normal $PaCO_2$
- ○ PEF 33-50% predicted
- ○ Respiratory rate <25

threatening asthma?

Peer responses

| | | |
|---|---|---|
| ○ | Heart rate <110 bpm | 1% |
| ○ | Inability to complete sentences in one breath | 24% |
| ◉ | Normal PaCO2 ✔ Correct answer selected | 67% |
| ○ | PEF 33-50% predicted | 6% |
| ○ | Respiratory rate <25 | 2% |

Hyperventilation in asthma should cause a low PaCO2 as CO2 is 'blown off'. A normal CO2 in an unwell asthmatic suggests that the ventilator exchange mechanisms are beginning to fail. All the other answers are markers of acute severe asthma.

A 35-year-old patient with known well-controlled atopic asthma presents to the emergency department with an acute asthma attack. She had been over at her friend's house (who owns a cat) and about 15 minutes later she felt wheezy and breathless. She decided to go to A+E.

On examination she is clearly breathless but able to converse in short sentences. She has a heart rate of 113bpm, BP 121/76mmHg, Saturations 95% on air, temperature 37.1°C. Auscultation reveals widespread wheeze throughout both lung fields. Her Peak flow is 280 (her best peak flow is 400).

What is the most appropriate initial management of this patient?

- Salbutamol and atrovent nebuliser, amoxicillin and 40mg prednisolone
- Salbutamol and atrovent nebuliser and 40mg prednisolone
- Salbutamol and atrovent nebuliser, 200mg hydrocortisone
- Salbutamol and atrovent nebuliser, 30mg prednisolone and 4g magnesium sulphate
- Salbutamol nebuliser, amoxicillin and 40mg prednisolone

Salbutamol and atrovent nebuliser and 40mg prednisolone ✔ Correct answer selected — 57%

Salbutamol and atrovent nebuliser, 200mg hydrocortisone — 33%

Salbutamol and atrovent nebuliser, 30mg prednisolone and 4g magnesium sulphate — 7%

Salbutamol nebuliser, amoxicillin and 40mg prednisolone — 2%

This patient has an acute exacerbation of her asthma. As such, the initial management should include nebulised bronchodilators (salbutamol and atrovent) and steroids. Oral steroids are as effective as intravenous delivery, provided the patient can take oral medication. There is no evidence of infection, so antibiotics are not warranted. This patient does not require IV magnesium sulphate as yet, and this should be reserved if she does not respond to initial treatment.

A 68-year-old man with a 60 pack year history presents with cough and haemoptysis. A chest X-ray shows a right hilar mass. Bronchoscopy is undertaken and biopsy confirms the diagnosis of carcinoma of bronchus. His calcium levels are 3.49 mmol/l (2.2-2.5) with a raised PTHrp concentration.

What is the most likely histological subtype for this carcinoma?

- Adenocarcinoma
- Alveolar-cell carcinoma
- Fibrosarcoma
- Small cell carcinoma
- Squamous cell carcinoma

| | | |
|---|---|---|
| ○ | Adenocarcinoma | 5% |
| ○ | Alveolar-cell carcinoma | 0% |
| ○ | Fibrosarcoma | 0% |
| ○ | Small cell carcinoma | 25% |
| ○ | Squamous cell carcinoma ✔ Correct answer selected | 69% |

Hypercalcaemia and elevated parathyroid hormone related peptide levels are most commonly associated with squamous cell carcinoma. Small cell carcinoma and cancers with bone metastases may be also be associated with hypercalcaemia but not with increased PTHrH levels.

A 62 year old man is admitted to MAU by his GP with a 5 day history of productive cough and feeling unwell. He has no other medical history of note. His cough is productive of a greenish sputum and he has become increasingly breathless. He is an ex-smoker, having stopped 10 years ago. He takes no medication.

On examination, he appears unwell, has a BMI of 28.5 kg/m2, a pulse of 90 bpm regular, a blood pressure of 124/68 mmHg and oxygen saturations on air of 94%. His temperature is 38.8C and his respiratory rate is 30. Auscultation of the heart is normal and examination of the chest reveals some crackles at the right base.

His results reveal:

| | |
|---|---|
| Sodium | 136 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 8.6 mmol/l (3-8) |
| Creatinine | 110 micromol/l (50-100) |
| Haemoglobin | 13.5 g/l (120-160) |
| White cell Count | $14.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |
| C-Reactive Protein | 128 mg/dl (<5) |

The chest x-ray reveals haziness at the right base.

Which of the following is the most appropriate treatment for this patient?

- ○ IV amoxicillin plus IV clarithromycin
- ○ IV ciprofloxacin
- ○ IV levofloxacin
- ○ Oral amoxicillin plus clarithromycin
- ○ Oral co-trimoxazole

IV amoxicillin plus IV clarithromycin — 52%

IV ciprofloxacin — 0%

IV levofloxacin — 1%

Oral amoxicillin plus clarithromycin ✔ Correct answer selected — 46%

Oral co-trimoxazole — 1%

This man has a CURB-65 score of 2, suggesting moderately severe pneumonia, and requires admission and treatment with oral amoxicillin plus clarithromycin. IV treatment with benzylpenicillin/amoxicillin plus clarithromycin can be used in subjects who are unable to take oral treatment. There is no indication here that the patient is unable to take oral medication.

A 68-year-old lady presents to the acute medical unit via her GP on a Friday evening with a 2-week history of increasing breathlessness on exertion. She has a past medical history of breast cancer, radically treated 8 years ago, and hypertension. She is an ex-smoker, with a 20-pack year history, She reports a dry cough and a reduction in her exercise tolerance. She now describes being breathless walking up 1 flight of stairs.

On examination, she appears comfortable at rest, her oxygen saturations are 98% on air and her respiratory rate is 19/min. Her pulse is 88bpm and blood pressure 150/88 mmHg. Examination of her cardiovascular system is entirely normal with no peripheral oedema. Auscultation of her chest reveals reduced air entry at the right base. A chest-xray shows a moderate right-sided effusion.

Her blood results are as below:

| | |
|---|---|
| **Hb** | 11.5 g/dl (12-16) |
| **MCV** | 91 fL (85-95) |
| **WBC** | 9.6 x 109/L (3-10) |
| **Platelet** | 150 x109/L (140-400) |
| **Sodium** | 132 mmol/L (134-144) |

| | |
|---|---|
| **Platelet** | 150 x109/L (140-400) |
| **Sodium** | 132 mmol/L (134-144) |
| **Potassium** | 3.8 mmol/L (3.4-5) |
| **Urea** | 7.9 mmol/L (3-8) |
| **Creatinine** | 83 micromol/L (50-100) |

What is the most appropriate management of this patient?

- ○ Departmental thoracic ultrasound and marking for diagnostic aspiration
- ○ Departmental thoracic ultrasound and marking for thoracocentesis
- ○ Intercostal chest drain insertion
- ○ Referral to pleural clinic to be seen as an urgent out-patient
- ○ Referral to respiratory team as in-patient

Departmental thoracic ultrasound and marking for diagnostic aspiration ✖ Incorrect answer selected — 55%

Departmental thoracic ultrasound and marking for thoracocentesis — 14%

Intercostal chest drain insertion — 3%

Referral to pleural clinic to be seen as an urgent out-patient ← Correct answer — 11%

Referral to respiratory team as in-patient — 16%

Although symptomatic, this lady is currently stable. There is nothing in the examination to suggest that this lady requires urgent out-of-hours' intervention, and departmental ultrasound marking is not recommended. A chest drain should not be the initial management of choice, and a therapeutic aspiration (with real time bedside ultrasound), with samples sent for diagnostic purposes, is appropriate. As this patient is unlikely to be seen until Monday by the respiratory team, and is stable, she can be managed as an urgent out-patient in the appropriate pleural clinic.

A 66-year-old lady has recently been diagnosed with adenocarcinoma and is being discussed at the regional MDT regarding treatment options. Her CT showed a T2, N1, M0 tumour in the right upper lobe, which was confirmed on PET CT. She is otherwise fit and well, with a performance status of 1.

Which of the following would be the most appropriate initial choice of treatment for this patient?

- Chemotherapy
- Lobectomy
- Pneumonectomy
- Radiotherapy
- Wedge resection

Chemotherapy 13%

Lobectomy ✔ Correct answer 64%

selected

Pneumonectomy 14%

Radiotherapy 6%

Wedge resection 4%

NICE guidance is that patients with NSCLC who are medically fit and suitable for treatment with curative intent should be offered lobectomy as first choice treatment. Those of borderline fitness and small tumours can be considered for lung parenchymal sparing resections (such as wedge resection) if complete resection can be achieved

A 62 year old man is admitted to MAU by his GP with a 5 day history of productive cough and feeling unwell. He has no other medical history of note. His cough is productive of a greenish sputum and he has become increasingly breathless. He is an ex-smoker having stopped 10 years ago. He takes no medication.

On examination, he appears unwell, has a BMI of 28.5 kg/m2, a pulse of 90 bpm regular, a blood pressure of 124/68 mmHg and oxygen saturations on air of 94%. His temperature is 38.8C and his respiratory rate is 30. Auscultation of the heart is normal and examination of the chest reveals some crackles at the right base.

His results reveal:

| | |
|---|---|
| Sodium | 136 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 8.6 mmol/l (3-8) |
| Creatinine | 110 micromol/l (50-100) |
| Haemoglobin | 13.5 g/l (120-160) |
| White cell Count | $14.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |
| C-Reactive Protein | 128 mg/dl (<5) |

The chest x-ray reveals haziness at the right base.

What is the CURB-65 score in this patient?

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ 4

0 — 0%

1 — 5%

2 ← Correct answer — 90%

3 ✖ Incorrect answer selected — 4%

4 — 0%

The CURB-65 score is a score used in community acquired pneumonia with prognostic value. His CURB65 score can be calculated as follows:

| | |
|---|---|
| Confusion | 0 |
| Urea >7 | 1 |
| Respiratory rate >30 | 1 |
| BP Systolic <90, Diastolic <60 | 0 |
| 65 years of age or above | 0 |

A 38 year old Asian man is admitted with shortness of breath. He has a background of ulcerative colitis and recently had a moderately severe flare during which he was commenced on 2 weekly infusions of Infliximab. Over the last 48 hours he has become increasingly unwell with cough and fever. His other medication includes Mesalazine 4.8g daily. He has no known allergies He is otherwise fit and well.

His observations are as follows:

HR 105 bpm

BP 108/64 mmHg

RR 23/min

Temp 36.9C

On examination there are bilateral crackles throughout the chest.

His chest radiograph shows widespread small nodular opacities distributed throughout the lung.

What is the best antibiotic(s) to commence in this gentleman?

- ○ Amoxicillin and Clarithromycin
- ○ Co-Trimoxazole
- ○ Doxycycline
- ○ Rifampicin, Isoniazid, Ethambutol and Pyrazinamide
- ○ Tazocin

Amoxicillin and Clarithromycin 4%

Co-Trimoxazole 19%

Doxycycline 0%

Rifampicin, Isoniazid, Ethambutol and Pyrazinamide ✔ Correct answer selected 70%

Tazocin 6%

This gentleman has miliary TB. Anti-TNF agents can cause relapses of previously dormant or unknown TB, and these often present as miliary TB due to the immunosuppressive effects of infliximab. All patients should be screened for TB vaccination prior to treatment, but sometimes this is missed, especially in emergencies. a such the correct treatment here is for TB.

A 64 year old woman is admitted with shortness of breath of 8 hours' duration. She was admitted to hospital 3 weeks ago with the same problem. She became breathless over a period of a few days and when admitted on the last occasion you see from the portal that she had a CTPA which was normal and was diagnosed with asthma. After being treated with inhalers she was discharged. Her Peak Flow rate was 260 l/min. She has an appointment for the respiratory physicians in about 2 weeks but on this occasion felt she needed to be admitted.

On this occasion, she describes this problem with breathlessness which has deteriorated over the last 24 hours. She has had an unproductive cough. She becomes increasingly breathless on any exertion and has found it particularly difficult to get round the house. She is rather tearful and is under a lot of pressure at home as her granddaughter lies with her and is 'playing her up'. She is unaware of any chest pain. On the background history, she is obese and has type 2 diabetes.

On examination, her pulse is 98 bpm, oxygen saturations are 96% on air, temperature is 37C, respiratory rate is 25/min and her blood pressure is 120/88 mmHg. She appears dyspnoeic at rest and has a peak flow of 260 which improves to 340 following nebulised salbutamol. She is obese with a BMI of 42 kg/m2. Auscultation of the chest is normal with no audible wheeze. There is no ankle oedema and the calves are soft and non-tender.

Investigations show normal FBC, U+Es and a CRP of 20 mg/dl. Chest x-ray is normal although slightly underpenetrated. Arterial gases show:

| | |
|---|---|
| pH | 7.27 (7.34-7.44) |

underpenetrated. Arterial gases show:

| | |
|---|---|
| pH | 7.37 (7.34-7.44) |
| pO2 | 10.2 kPa (11-13) |
| PCO2 | 4 kPa (4.5-6) |

Which of the following is the most appropriate management strategy for this patient?

- ○ Discharge and continue follow up with respiratory team
- ○ Discharge and treat with course of oral antibiotics
- ○ Request CTPA
- ○ Request D-dimer
- ○ Request dopplers of the leg veins

Discharge and continue follow up with respiratory team 43%

Discharge and treat with course of oral antibiotics 2%

Request CTPA 12%

Request D-dimer ✔ Correct answer selected 41%

Request dopplers of the leg veins 3%

It is likely that this patient is breathless as a consequence of her morbid obesity with probable asthma and quite an element of psychological overlay. However, in view of the fact that she was admitted to hospital just 3 weeks ago and is obese requires the exclusion of PE. Therefore, the most appropriate approach would be to initially check a D-dimer concentration and if this were normal then no further investigation would be required. That the patient had a CTPA previously would be somewhat irrelevant as venous thromboembolism could have occurred at home and, in view of her co-morbidities she would be considered a higher risk. However her Wells score is less than 4 and with a negative d-dimer PE would be very unlikely, hence CTPA not required.

A 31 year old male, normally fit and well, who has never smoked, presents with sudden onset pleuritic chest pain and shortness of breath. CXR reveals a large left sided pneumothorax (4 cm at the level of the hilum). Oxygen saturations are 95% on air.

Which of the following is the most appropriate next step in his management according to British Thoracic Society Guidelines?

- Chest drain insertion
- High flow oxygen
- Observation only
- Refer to cardio-thoracic surgeons
- Simple aspiration

Observation only 0%

Refer to cardio-thoracic surgeons 0%

Simple aspiration ✔ Correct 66%

answer selected

BTS guidelines for a primary pneumothorax as in this case (young age, no smoking history, no chronic lung disease) recommend simple aspiration in the first instance up to 2.5 L. If this is successful and the pneumothorax becomes less than 2 cm at the level of the hilum and symptomatically better they can be potentially discharged and reviewed in 2-4 weeks in respiratory outpatients. If aspiration fails chest drain is likely to be required.

A 30-year-old woman with no past medical history was admitted with fever, breathlessness and a productive cough. She was not taking any regular medication and was not pregnant.

At presentation she had a blood pressure of 80/50 mmHg and was given 2 litres of rapid intravenous saline. Her vital signs were recorded again and were as follows:

| Test | Result | Normal ranges |
|---|---|---|
| Temperature | 38°C | 36.1°-37.2°C |
| Respiratory rate | 26 breaths/min | 16–20 breaths/min |
| Heart rate | 110 bpm | 50–80 bpm |
| Blood pressure | 80/50 mmHg | 120/80 mmHg |
| Oxygen saturations on air | 92% | 95 to 100% |
| Venous blood gas lactate | 5 mmol/l | (0.5-1 mmol/l) |

She is also confused. According to NICE guidelines, what should happen next?

- ○ Arrange urgent ITU admission
- ○ Immediate IV amoxicillin/clarithromycin
- ○ Immediate dose oral cotrimoxazole
- ○ IV bolus bicarbonate
- ○ IV bolus hydrocortisone

Immediate IV amoxicillin/clarithromycin ✔ Correct
answer selected

63%

Immediate dose oral cotrimoxazole

0%

IV bolus bicarbonate

0%

IV bolus hydrocortisone

1%

**Explanation**

NICE guidelines recommend that all patients aged 12 years and over who have suspected sepsis and 1 or more high risk criteria should receive an immediate senior review and a broad-spectrum antimicrobial at the maximum recommended dose without delay (within 1 hour of identifying that they meet any high risk criteria in an acute hospital setting)'.

**References**

A 72-year-old man presents to accident and emergency with a 12-hour history of breathlessness. He also reports some loose stools. He is a current smoker with a 62-pack year history.

On examination he is dyspnoeic, has a pulse of 117 bpm, a respiratory rate of 27 with oxygen saturations of 88% on air. He has a temperature of 38.6°C. Auscultation of his chest reveals crackles and reduced air entry at the right base. His abdomen is also distended with dullness in the flanks.

Investigations are as follows:

| | |
|---|---|
| **Hb** | 10.2 g/dl (12-16) |
| **MCV** | 104 fL (85-95) |
| **WBC** | 13.6 x 109/L (3-10) |
| **Platelet** | 85 x109/L (140-400) |
| **AST** | 82 U/L (0-50) |
| **ALP** | 330U/L (50-110) |
| **Gamma GT** | 820U/L (0-50) |
| **Sodium** | 132 mmol/L (134-144) |
| **Potassium** | 3.3 mmol/L (3.4-5) |

| | |
|---|---|
| **Sodium** | 132 mmol/L (134-144) |
| **Potassium** | 3.3 mmol/L (3.4-5) |
| **Urea** | 7.9 mmol/L (3-8) |
| **Creatinine** | 74 micromol/L (50-100) |
| **INR** | 1.5 |
| **CK** | 800U/L (50-250) |
| **Chest X-ray** | Right lower lobe consolidation |

What is the most likely diagnosis?

- ○ Aspiration pneumonia
- ○ E. Coli pneumonia
- ○ Klebsiella pneumonia
- ○ Mycoplasma pneumonia
- ○ Streptococcus pneumonia

| | | |
|---|---|---|
| A | Aspiration pneumonia ✔ | 18% |
| | Correct answer selected | |
| B | E. Coli pneumonia | 10% |
| C | Klebsiella pneumonia | 19% |
| D | Mycoplasma pneumonia | 42% |
| E | Streptococcus pneumonia | 11% |

This gentleman is very likely to abuse alcohol and have alcoholic liver disease (thrombocytopenia, raised MCV, deranged clotting and deranged LFTs). There is also evidence of ascites on examination. This, combined with the timing of his presentation, suggests that he was very intoxicated, likely ended up on the floor (note the raised CK) and has aspirated. The location of the pneumonia would also be in keeping with an aspiration.

A 45 year old man is admitted with a 3 week history of dry cough, breathlessness and weight loss. He has otherwise been fit and well and has no other medical history of note. He takes no medication and is a non-smoker. He has become increasingly dyspnoeic and has occasional episodes where he becomes particularly breathless and panicky. He has lost approximately 3kg in weight over this time.

On examination, he has a BMI of 28kg/m2, his pulse is 100 bpm, blood pressure 118/86 mmHg and his temperature is 38C. His oxygen sats are 92% on air. Examination of the chest reveals some scattered wheeze but little else. The calves are soft and non-tender.

Investigations reveal:

| | |
|---|---|
| Haemoglobin | 141 g/l (12-16) |
| White cell count | $17x10^9$/l (2-10 |
| Platelets | $188x10^9$/l (140-450) |
| U+Es | Normal |
| C-reactive protein | 36 mg/l (<5) |
| pH | 7.42 (7.35-7.45) |
| P02 | 10.1 (10.5-14) |
| PCO2 | 4.0 (4.5-6) |
| ECG | Normal |
| CXR | Normal |

Which of the following is the most likely diagnosis?

- ○ Asthma
- ○ Atypical pneumonia
- ○ Community acquired pneumonia
- ○ Multifocal bronchioalveolar carcinoma
- ○ Pulmonary emboli

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| | | |
|---|---|---|
| COPD | **No** 0 | Yes +1 |
| Present or previous malignancy | **No** 0 | Yes +2 |
| Other risk factors | **No** 0 | Yes +1 |

**2 points**

Caprini VTE Score

**Low risk**

Recommended prophylaxis: Pneumatic compression devices ± graduated compression stockings

**Minimal VTE risk**

During hospitalization for duration of chemoprophylaxis

Next Steps »»

Next Steps | Evidence | Creator Insights

## ADVICE

While many hospitals have developed institution-wide policies for VTE prophylaxis based on risk assessment models, the decision for type and duration of VTE prophylaxis should ultimately be left up to the surgeon's

| | |
|---|---|
| Asthma | 9% |
| Atypical pneumonia ✖ Incorrect answer selected | 38% |
| Community acquired pneumonia | 3% |
| Multifocal bronchioalveolar carcinoma | 22% |
| Pulmonary emboli ← Correct answer | 27% |

In this scenario of a young man, otherwise well with a month long history of breathlessness, which appears episodic, and weight loss with reduced oxygen saturations, a lowish CRP and hypoxia on blood gas analysis, one needs to exclude multiple pulmonary embolism. In this case pneumonia is a possibility as is asthma yet the absence of any changes on CXR would argue against the former and the 'sudden' development of asthma in a young man with no other atopy would be unusual for the latter. Mild pyrexia, elevated WCC and wheeze/cough are not uncommon presenting features in PE and this needs exclusion. Similarly modestly elevated CRP is more in keeping with PE as CRP>100 is typical of pneumonias. CTPA would be the appropriate investigation here as missing the diagnosis may be fatal.

PE fever and high CRP

| | | |
|---|---|---|
| Clinical signs and symptoms of DVT | **No 0** | Yes +3 |
| PE is #1 diagnosis OR equally likely | No 0 | **Yes +3** |
| Heart rate > 100 | No 0 | **Yes +1.5** |
| Immobilization at least 3 days OR surgery in the previous 4 weeks | **No 0** | Yes +1.5 |
| Previous, objectively diagnosed PE or DVT | **No 0** | Yes +1.5 |
| Hemoptysis | **No 0** | Yes +1 |
| Malignancy w/ treatment within 6 months or palliative | **No 0** | Yes +1 |

**1.5 points**

Low risk group: 1.3% chance of PE in an ED population.

Another study assigned scores ≤ 4 as "PE Unlikely" and had a 3% incidence of PE.

**Next Steps** »»

A 45 year old man was admitted with chest tightness and cough of approximately 6 weeks' duration. He denied any fever but had on occasions produced greenish sputum. He had seen his GP two weeks previously and was treated with amoxicillin but his cough had not really improved and the evening of his admission he became particularly and suddenly breathless.

On admission, he was found to have a temperature of 38.3C, a pulse of 100 bpm and sats of 94% on room air. He had a respiratory rate of 22/min and scattered wheezes on chest examination. Of note, his white cell count was 9 (3-10), CRP was 44 mg/dl, arterial PO2 was noted to be 10.3kPa (10.5-14) and PCO2 3.8kPa (4.5-6) and chest x-ray revealed no consolidation. ECG was normal. He was treated for a community acquired pneumonia with IV augmentin and oral clarithromycin. He received prophylactic low molecular weight heparin according to the hospital protocol.

Within 6 hours his temperature had subsided but he still felt rather breathless.

The following day he was reviewed by the respiratory consultant who noted a family history of asthma with his son using an inhaler.

Observations were stable but he was found to have an audible wheeze again and was diagnosed with adult onset asthma. He was treated with nebulised salbutamol and prednisolone 30mg daily. 9pm the following night, the patient becomes acutely unwell. He is seen by the duty F2. He describes acute breathlessness and is dyspnoeic. He is tachycardic and has a pulse of 105 bpm although had inhaled salbutamol an hour previously. His oxygen saturations are 92%, his temperature is 36.7C and his blood pressure is 1228/70 mmHg. His ECG was normal. His peak flow was 390.

Investigations at this stage reveal:

| | |
|---|---|
| Chest x-ray | Normal |
| pO2 | 8.3 kPa |
| PCO2 | 3.3 kPa |

He settles down with further nebulisers and his Peak flow is 550.

He is seen the following morning where his breathlessness has improved, though he remains slightly dyspnoeic, he is apyrexial and his peak flow is 550. He is now keen to go home.

Which of the following is the appropriate management for this patient?

- ○ Discharge and arrange outpatient lung studies and OP respiratory review
- ○ Discharge with arrangement for OP respiratory review
- ○ Remain as an inpatient and organise a CTPA
- ○ Remain as an inpatient, organise lung function studies and chest and abdo CT
- ○ Remain as an inpatient and organise muscle studies

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Wells' Criteria for Pul...
mdcalc.com

| | | |
|---|---|---|
| symptoms of DVT | | |
| PE is #1 diagnosis OR equally likely | No 0 | **Yes +3** |
| Heart rate > 100 | No 0 | **Yes +1.5** |
| Immobilization at least 3 days OR surgery in the previous 4 weeks | **No 0** | Yes +1.5 |
| Previous, objectively diagnosed PE or DVT | **No 0** | Yes +1.5 |
| Hemoptysis | **No 0** | Yes +1 |
| Malignancy w/ treatment within 6 months or palliative | **No 0** | Yes +1 |

# 4.5 points

Moderate risk group: 16.2% chance of PE in an ED population.

Another study assigned scores ≤ 4 as "PE Unlikely" and had a 3% incidence of PE.

Another study assigned scores > 4 as "PE Likely" and had a 28% incidence of PE.

**Next Steps »»**

Discharge and arrange outpatient lung studies and OP respiratory review — 23%

Discharge with arrangement for OP respiratory review — 10%

Remain as an inpatient and organise a CTPA ✔ Correct answer selected — 59%

Remain as an inpatient, organise lung function studies and chest and abdo CT — 7%

Remain as an inpatient and organise muscle studies — 1%

One must consider PE on this case even from the original admission. Subsegmental PEs can cause these symptoms of cough, wheeze and weight loss. These nagging symptoms lasting weeks are well reported. Whilst one could be forgiven for making the original diagnosis of pneumonia, the fact that he didn't really improve remaining breathless and then suddenly becoming particularly hypoxic should point towards a diagnosis of PEs. This patient should remain as an inpatient, treat with treatment dose LMWH prior to having a CTPA.

- Pulmonary embolism emedicine

A 40 year old woman is admitted with acute central chest pain and breathlessness. She has no past medical history of note but has been on the OCP. CTPA confirms a diagnosis of pulmonary embolism. On examination she has a heart rate of 112 bpm, a blood pressure of 106/60 mmHg, a respiratory rate of 22/min, sats of 94% on room air, a temperature of 37.2C and her GCS is 15/15.

Which of the following reflects her simplified PESI score?

- ○ 0
- ○ 1
- ○ 2
- ○ 3
- ○ The PESI score is not appropriate in this scenario

| | |
|---|---|
| 0 | 4% |
| 1 ✔ Correct answer selected | 40% |
| 2 | 23% |
| 3 | 10% |
| The PESI score is not appropriate in this scenario | 24% |

The PESI score is the Pulmonary Embolism Severity Index and reflects prognosis and therefore ability to treat PE as an outpatient. The score is illustrated in the following table and, as you can see, our patient scores 1 for heart rate greater than 110. A score of 1 and above reflects a 30 day mortality rate of 11% vs 0 of 1%.

A 25 year old lady who is 28 weeks' pregnant presents with acute onset of breathlessness and a central chest pain. She presents to the medical emergency admissions on a Friday evening. There is no other past history of note and she is gravida 2, para 1. On examination, heart rate is 85 bpm, blood pressure is 115/70 mmHg, respiratory rate is 16/min and oxygen saturations are 98% on air. There is no clinical evidence of deep vein thrombosis. You are clinically suspicious of a pulmonary embolism. Her PESI score is 25 – signifying her age.

Which of the following is the most appropriate management for this patient?

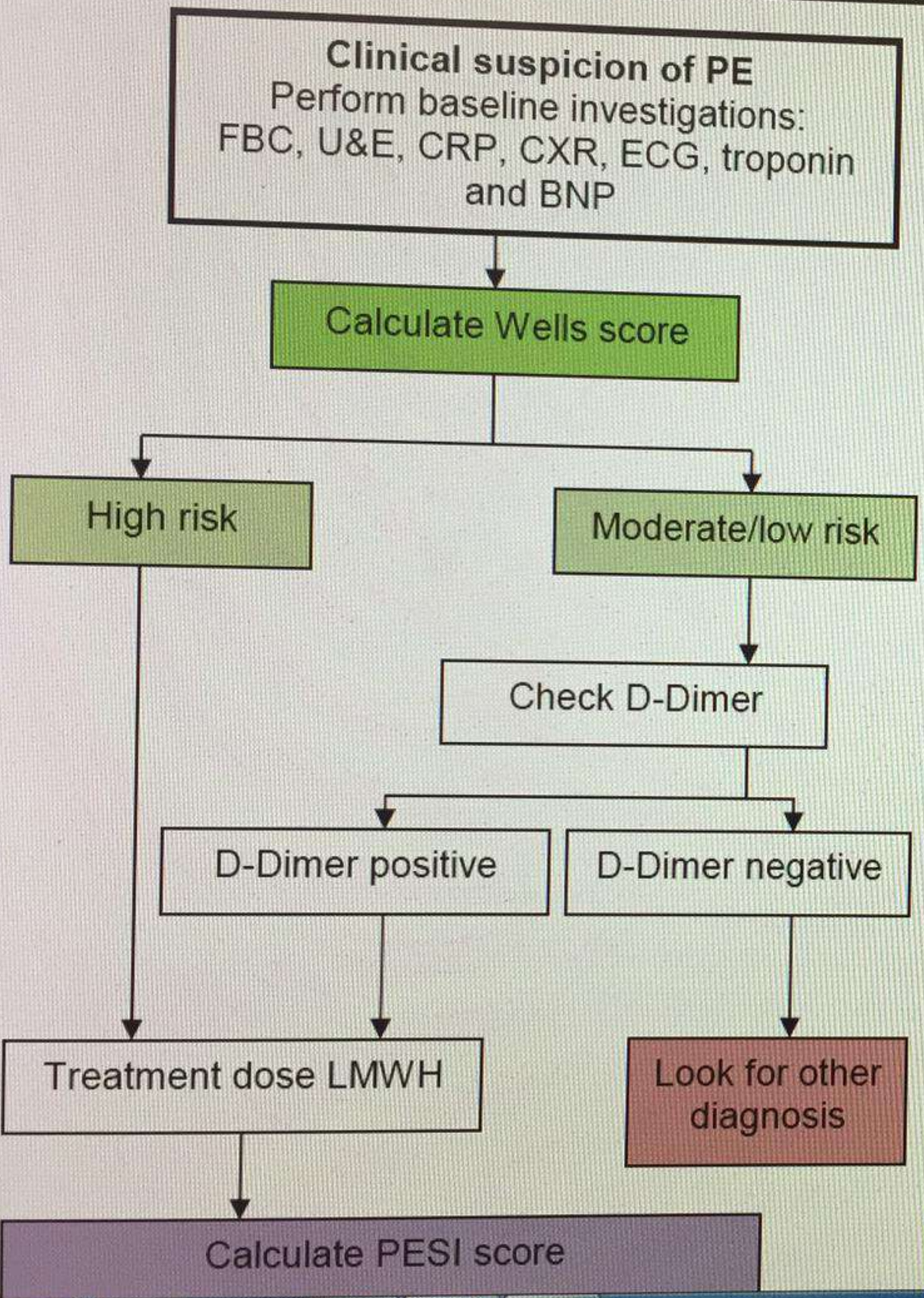
- Admit and prescribe low molecular weight heparin with a view to VQ scan on Monday
- Admit and treat with apixaban until a CTPA on Monday
- Base treatment decisions on a D-dimer measurement
- Discharge with treatment dose low molecular weight heparin over weekend and arrange for VQ Monday
- Request a CTPA that evening for definitive management

- Admit and prescribe low molecular weight heparin with a view to VQ scan on Monday ← Correct answer — 39%
- Admit and treat with apixaban until a CTPA on Monday — 2%
- Base treatment decisions on a D-dimer measurement — 5%
- Discharge with treatment dose low molecular weight heparin over weekend and arrange for VQ Monday ✖ Incorrect answer selected — 33%
- Request a CTPA that evening for definitive management — 21%

This patient is pregnant and whilst the PESI score is low, guidance suggests that this patient should be admitted and treated with low molecular weight heparin until a definitive investigation (VQ) can be arranged. All trials associated with PESI scores do not include pregnant women and hence there is no evidence for ambulatory management in such patients. Were this patient not to be pregnant then ambulatory management would be entirely appropriate. D-dimer is highly likely to be elevated in pregnancy and so is irrelevant in decision making.

Hestia Criteria

# Suspected Pulmonary Embolus - Investigation Pathway




| Wells Score (PE) | |
|---|---|
| **Clinical Feature** | **Points** |
| Clinical signs and symptoms of DVT | 3 |
| No other diagnosis more likely | 3 |
| HR >100 | 1.5 |
| Immobility (>3/7) or surgery (4/52) | 1.5 |
| Previous PE/DVT | 1.5 |
| Haemoptysis | 1 |
| Malignancy (active or within 6/12) | 1 |
| HIGH risk | >6 points |
| MODERATE risk | 2 - 6 points |
| LOW risk | <2 points |

| Simplified PESI Score (Prognostic) | |
|---|---|
| **Clinical Feature** | **Points** |
| Age >80 | 1 |
| History of cancer | 1 |
| History of heart failure/lung disease | 1 |
| HR >/= 110/min | 1 |
| Systolic BP <100 mmHg | 1 |
| $SpO_2$ <90% | 1 |
| HIGH risk | >/=1 |
| LOW risk | 0 |

**Exclusion Criteria for Ambulatory Care**

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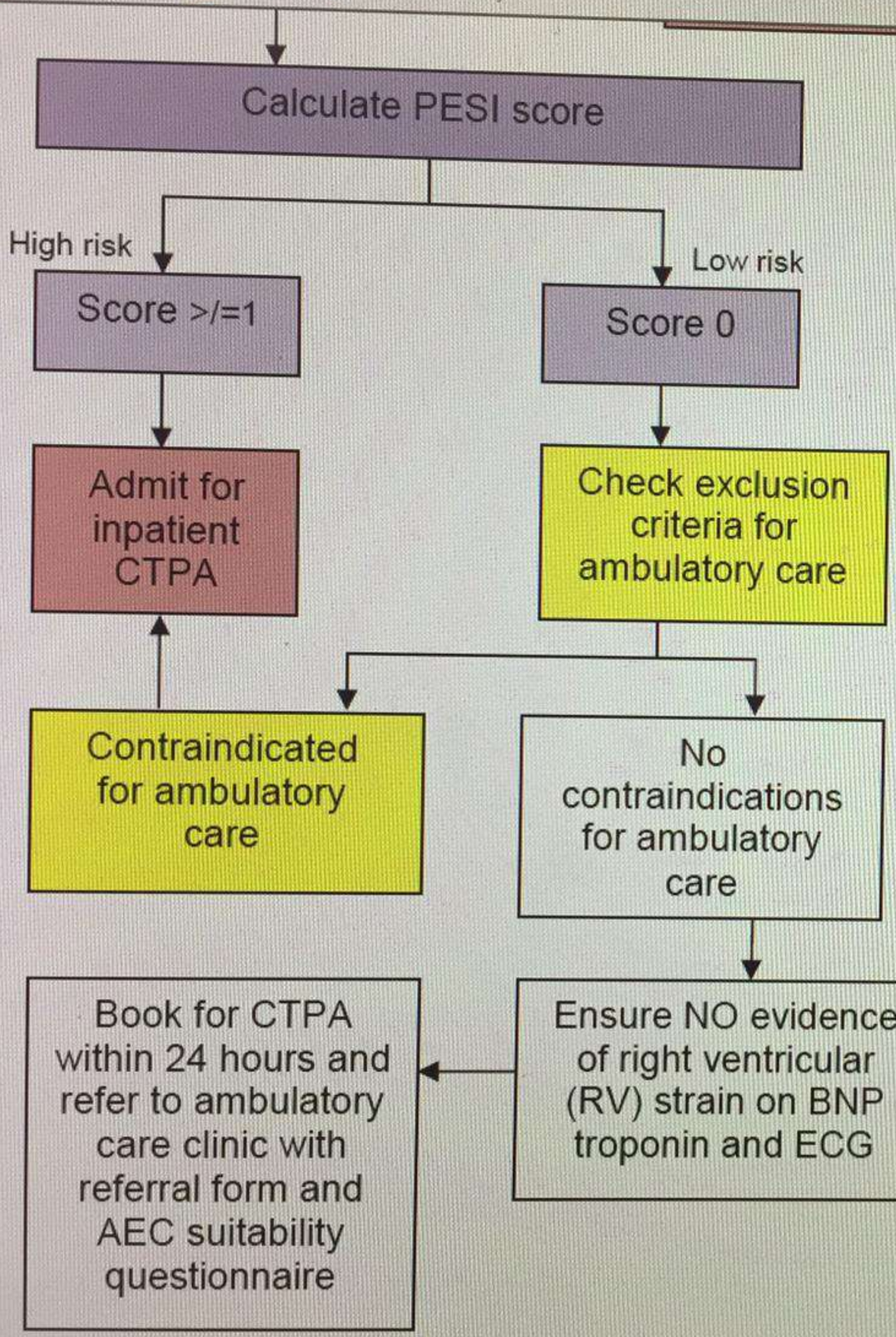
http://swanlive/sites/default/files/guideline_111.pdf
swanlive
Suggested Sites
UpToDate
Web Slice Gallery


Calculate PESI score
High risk
Low risk
Score >/=1
Score 0
Admit for inpatient CTPA
Check exclusion criteria for ambulatory care
Contraindicated for ambulatory care
No contraindications for ambulatory care
Ensure NO evidence of right ventricular (RV) strain on BNP troponin and ECG
Book for CTPA within 24 hours and refer to ambulatory care clinic with referral form and AEC suitability questionnaire

| | |
|---|---|
| LOW risk | 0 |

**Exclusion Criteria for Ambulatory Care**

| |
|---|
| Co-existing major DVT or pneumonia |
| PE whilst on anticoagulation |
| Presenting with syncopal episode |
| Active malignancy |
| Prior cardiac or respiratory disease |
| Pregnant |
| Reaction to warfarin or heparin/dalteparin |
| Active bleeding |
| INR >1.5 or PLT <50 x $10^9$/l |
| GI/GU bleed within last 2 weeks |
| Intracranial bleed ever in the past |
| Known or suspected alcohol dependence |
| Poor compliance suspected |
| Cognitive impairment |
| Severe renal dysfunction (eGFR <30 ml/min/1.73 $m^2$) |
| Uncontrolled pain on oral analgesia |

- Haemodynamically unstable patients require immediate referral and urgent CTPA
- Pregnant women should be discussed with the Obs & Gynae registrar (CTPA versus ventilation/perfusion (VQ) scan)
- LMWH dosing can be found in guideline 238

## Contraindications to ambulatory care, i.e. ambulatory care exclusion criteria

| |
|---|
| Co-existing major DVT or pneumonia |
| PE whilst on anticoagulation |
| Presenting with syncopal episode |
| Active malignancy |
| Prior cardiac or respiratory disease |
| Pregnant |
| Reaction to warfarin or heparin/dalteparin |
| Active bleeding |
| INR >1.5 or PLT <50 x $10^9$/l |
| GI/GU bleed within last 2 weeks |
| Intracranial bleed ever in the past |
| Known or suspected alcohol dependence |
| Poor compliance suspected |
| Cognitive impairment |
| Severe renal dysfunction (eGFR <30 ml/min/1.73 $m^2$) |
| Uncontrolled pain on oral analgesia |

## LMWH dosing schedule

See Guideline 238 Anticoagulant Treatment for Adult Patients with Venous Thromboembolism.

A 19-year-old man presents to hospital with a 1-day history of left sided pleuritic chest pain. He feels a little breathless. He smokes 15 cigarettes per day and admits to some cannabis use. He has no past medical history of note.

On examination he looks comfortable. He is approximately 1.90m tall and has a BMI of 19 $kg/m^2$. He is not dyspnoeic. Examination of his chest is unremarkable except for a clicking sound heard in association with the heart sounds.

Chest x-ray is unremarkable.

Given the most likely diagnosis, which of the following initial investigations may help with diagnosis?

- CT thorax
- Echocardiogram
- ECG
- Expiratory chest X-ray
- Lateral decubitus chest x-ray

CT thorax 16%

Echocardiogram 27%

ECG 3%

Expiratory chest X-ray ✖ 33%

Incorrect answer selected

Lateral decubitus chest x-ray ← 21%

Correct answer

A synchronous click with the heart sounds is associated with small apical (left) pneumothorax, which can be missed on a traditional PA film. He is tall and in addition smokes – both known to be risk factors for developing pneumothorax.

Lateral decubitus chest x-rays may provide additional information, but expiratory chest x-ray is of little benefit. CT thorax should not be an initial investigation.

A 43 year old female presents with sudden onset of chest tightness and dyspnoea. She has a recent diagnosis of lymphoma for which she is under the care of the haematologists. On examination, she is comfortable at rest, has a pulse of 100 bpm regular, a blood pressure of 110/80 mmHg and oxygen saturations of 88% on room air. The Ventilation-Perfusion scan reveals a number of mismatched defects in the chest. Which of the following is the most appropriate initial treatment for this patient?

- Aspirin
- Low molecular weight heparin
- Thrombolysis
- Unfractionated heparin
- Warfarin

Aspirin 0%

Low molecular weight heparin 95%

✔ Correct answer selected

Thrombolysis 0%

Unfractionated heparin 4%

Warfarin 0%

This patient has had multiple pulmonary emboli on the basis of her presentation and confirmatory VQ scan. Low molecular weight heparin would be the recommended initial treatment for this patient. The patient is not shocked or severely distressed by a large PE that would warrant thrombolysis.

A 29-year-old female is admitted with a severe exacerbation of her asthma, and requires a 2-day stay in hospital. On discharge she is seen by a specialist asthma nurse and provided with a personalised asthma plan.

Regarding asthma management plans, which patients should receive one?

- ○ All asthma patients
- ○ Patients on step 2 or more
- ○ Patients under secondary care for their asthma
- ○ Patients who have attended A+E on at least 2 occasions
- ○ Patients who have been admitted to hospital with an exacerbation

answer selected

Patients on step 2 or more 8%

Patients under secondary care for their asthma 2%

Patients who have attended A+E on at least 2 occasions 5%

Patients who have been admitted to hospital with an exacerbation 18%

The BTS/Sign Guidelines (2016) recommend that all patients with asthma receive an individualised asthma management plan. The lack of asthma management plans was highlighted in the recent National Review into Asthma Deaths. Prior to discharge, following an asthma presentation, all patients should have inhaler technique and compliance checked, be provided with an asthma management plan (if they do not already have one), see their GP within 1 week and have specialist asthma follow up arranged (either clinician or specialist asthma nurse).

A 73 year old man is admitted to MAU by the GP with a 5 day history of cough and feeling unwell. He has otherwise been well with no other history of note. His cough is productive of a greenish sputum and he has become increasingly breathless. He is a non-smoker.

On examination, he has a BMI of 28.5 kg/m2, a pulse of 82 bpm regular, a blood pressure of 122/88 mmHg and oxygen saturations on air of 95%. His temperature is 38.5C and he has a respiratory rate of 26/min. Auscultation of the heart is normal and examination of the chest reveals some crackles at the right base.

His results reveal:

| | |
|---|---|
| Sodium | 136 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 6.8 mmol/l (3-8) |
| Creatinine | 98 micromol/l (50-100) |
| Haemoglobin | 13.3 g/l (120-160) |
| White cell Count | $12.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |

| | |
|---|---|
| Haemoglobin | 13.3 g/l (120-160) |
| White cell Count | $12.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |
| C-Reactive Protein | 55 mg/dl (<5) |

The chest x-ray reveals haziness at the right base.

Which of the following is the most appropriate approach to the management of this patient?

- ○ Admit to hospital and treat with IV amoxicillin
- ○ Admit to hospital and treat with IV amoxicillin and oral clarithromycin
- ○ Admit to hospital and treat with oral amoxicillin 500 mg tds
- ○ Discharge home and advise paracetamol
- ○ Discharge home with oral amoxicillin

8:04 PM ...4.4KB/s 89

# CURB-65 Score

CALCULATOR NEXT STEPS EVIDENCE CREATOR

Estimates mortality of community-acquired pneumonia to help determine inpatient vs. outpatient treatment.

When to Use Pearls/Pitfalls Why Use

| | | |
|---|---|---|
| **Confusion** | No 0 | Yes +1 |
| **BUN > 19 mg/dL (> 7 mmol/L)** | No 0 | Yes +1 |
| **Respiratory Rate ≥ 30** | No 0 | Yes +1 |
| **Systolic BP < 90 mmHg or Diastolic BP ≤ 60 mmHg** | No 0 | Yes +1 |

RESULT

## 1 points

Low risk group: 2.7% 30-day mortality.

Consider outpatient treatment.

oral amoxicillin 500 mg tds

Discharge home and advise paracetamol 0%

Discharge home with oral amoxicillin ✔ Correct answer selected 66%

This patient has a community acquired pneumonia. The important calculation here is the CURB-65 score which has prognostic significance. His CURB65 score is 1 and is calculated as follows:

| | |
|---|---|
| Confusion | 0 |
| Urea >7 | 0 |
| Respiratory rate >30 | 0 |
| BP Systolic <90, Diastolic <60 | 0 |
| 65 years or above | 1 |

Under these circumstances, the guidance with a CURB-65 of 0-1 suggests that the patient can be managed at home with oral amoxicillin.

- BTS Guidance for community acquired

StudyPRN

# Acute Medicine SCE Revision Other

Course overview Start

StudyPRN

# Acute Medicine SCE Revision Other

Question ID #3771

An 18 year old female is admitted as an emergency with acute facial swelling and difficulty breathing. She is not known to have any allergy but does suffer from mild asthma for which she occasionally uses a salbutamol inhaler. She was out having a picnic with her friends, eating various foods, when she suddenly became unwell, feeling particularly anxious and itchy, while developing facial/mouth swelling with difficulty breathing. Her friends called 999.

On examination, she has swelling of the face particularly around the eyes and lips. There are wheals around the neck. Pulse is 100 bpm and blood pressure 128/80 mmHg. She has an audible wheeze and oxygen saturations are 96% on air.

Which of the following is the most appropriate treatment for this patient?

- 0.5 mg adrenaline IV
- 0.5 mg adrenaline IM
- 10mg chlorpheniramine IM
- 100mg hydrocortisone IV
- 40mg oral prednisolone

| | | |
|---|---|---|
| ○ | 0.5 mg adrenaline IV | 3% |
| ○ | 0.5 mg adrenaline IM ✔ Correct answer selected | 87% |
| ○ | 10mg chlorpheniramine IM | 4% |
| ○ | 100mg hydrocortisone IV | 7% |
| ○ | 40mg oral prednisolone | 0% |

This patient has developed angioedema, urticarial and breathing difficulties typical of anaphylaxis. The patient should be treated with 0.5 mg IM adrenaline as the initial treatment as per the resuscitation council guidelines. Other treatments include IM/IV hydrocortisone and IM chlorpheniramine but the IM adrenaline and fluids is the initial treatment. The use of IV adrenaline is reserved for severe cases in whom expert understanding of IV adrenaline is understood.

**Reference**

A 21 year old male presents with a long history of weakness, muscle cramps and ease of fatigue. He denied use of any illicit substances and was otherwise fine. His mother had type 2 diabetes and he had two other brothers who were well. There was little of note on examination, his BMI was 29 $kg/m^2$ and the following results were obtained:

| | |
|---|---|
| **U+Es** | Normal |
| **AST** | 94 iu/l (5 - 40) |
| **ALT** | 90 iu/l (5 - 40) |
| **Alkaline phosphatase** | 88 ui/l (50 - 110) |
| **Bilirubin** | 12 micromol/l (0 - 18) |
| **CPK** | 1020 iu/l (30 - 220) |
| **LDH** | 300 iu/l (90 - 250) |
| **Calcium** | 2.4 mmol/l (2.2 - 2.6) |
| **Antibody screen** | Negative |
| **FBC** | Normal |
| **ESR** | 10 mm/hr (0 - 15) |

Which of the following is the most likely diagnosis?

- ○ Becker's muscular dystrophy
- ○ McArdle's disease
- ○ Non-alcoholic steatohepatosis
- ○ Thyrotoxic periodic paralysis
- ○ Vitimin D Deficiency

A 64-year-old woman presents with several episodes of hematemesis and a few days' history of melena. She denies any history of alcohol abuse but has been taking ibuprofen for pain in her knees for the last few weeks. Her haemoglobin has dropped by about 3.5 gm/l over the last few days. She is advised to stay overnight for blood transfusion and an urgent upper GI endoscopy the following morning. However, the patient refuses to receive treatment or be admitted as she does not like hospitals. She is not confused and is deemed to have capacity. There is no history of mental disorder.

Her obs are as follows:

| Test | Result | Normal ranges |
|---|---|---|
| Temperature | 36°C | 36.1–37.2°C |
| Respiratory rate | 18 breaths/min | 16–20 breaths/minute |
| Heart rate | 110 bpm | 50–80 bpm |
| Blood pressure | 110/50 mmHg | 120/80 mmHg |
| Oxygen saturations on air | 96% | 95 to 100% |

What would be the most appropriate course of action?

- ○ Call a psychiatric liaison nurse for an urgent review
- ○ Detain the patient under 'Deprivation of Liberty' order
- ○ Detain the patient under the Mental Health Act
- ○ Offer patient acute medication with a discharge summary and arrange early outpatient follow-up
- ○ Let patient leave the hospital (ask her to sign the 'discharge against medical advice' form)

Detain the patient under 'Deprivation of Liberty' order 4%

Detain the patient under the Mental Health Act 5%

Offer patient acute medication with a discharge summary and arrange early outpatient follow-up ✔ Correct answer selected 49%

Let patient leave the hospital (ask her to sign the 'discharge against medical advice' form) 40%

**Explanation**

According to law, if a patient is deemed to have mental capacity he or she can refuse treatment. In order to minimise risk to the patient it is wise to offer acute medications and arrange an early outpatient follow-up.

Which of the following scenarios is most likely to be an anaphylactic reaction?

- An itchy urticarial rash with lip swelling associated with normal blood pressure and normal respiration - onset 5 days ago.
- An urticarial rash with wheeze and low blood pressure - onset 15 minutes ago.
- Persistent low blood pressure with normal skin and mucosal appearance and normal respiration - onset 2 weeks ago.
- Respiratory wheeze with high blood pressure and normal skin and mucosal appearance - onset 10 days ago.
- Vomiting and diarrhoea with low blood pressure and normal skin/mucosal appearance and respiration - onset 3 days ago.

An urticarial rash with wheeze and low blood pressure - onset 15 minutes ago. ✔ Correct answer selected 97%

Persistent low blood pressure with normal skin and mucosal appearance and normal respiration - onset 2 weeks ago. 0%

Respiratory wheeze with high blood pressure and normal skin and mucosal appearance - onset 10 days ago. 1%

Vomiting and diarrhoea with low blood pressure and normal skin/mucosal appearance and respiration - onset 3 days ago. 0%

Anaphylaxis is highly likely when any one of the following three criteria are met:

1. Acute onset of an illness (this means minutes to several hours) with skin and/or mucosal tissue involvement PLUS at least one of:
    a. respiratory compromise
    b. reduced blood pressure
2. Acute onset (minutes to several hours) after exposure to a known allergen for the patient of two or more of the following: skin or mucosal tissue involvement, respiratory compromise, reduced blood pressure or associated symptoms and persistent gastrointestinal symptoms.
3. Reduced blood pressure after exposure to known allergen for patient (minutes to several hours):
    a. Infants and children: low systolic blood pressure (age specific) or >30% decrease
    b. Adults: systolic blood pressure of <90 mmHg or >30% decrease from person's baseline.

known allergen for patient (minutes to several hours):

a. Infants and children: low systolic blood pressure (age specific) or >30% decrease
b. Adults: systolic blood pressure of <90 mmHg or >30% decrease from person's baseline.

Patients at risk of anaphylaxis should be prescribed an adrenaline auto-injector (such as an epipen) to carry with them at all times, in case of an emergency.

**If in doubt it is best to assume anaphylaxis and to treat as an emergency with IM adrenaline.**

Child suffering from an anaphylactic reaction showing pronounced oedema round the eyes and lips and hives to the face and upper abdomen.

Further Reading:

NHS Choices (2014) Anaphylaxis

Suggested points for reflection:

1. What differentiates anaphylaxis from an allergic reaction?
2. What is urticaria?
3. What investigations may be useful in

A 62-year-old man is admitted after having had a seizure. He has had numerous admissions related to alcohol abuse, is generally non-compliant with therapy and has a history of alcohol-related seizures. He is under the care of the alcohol and drugs psychiatry team and they tried to help the patient withdraw from alcohol 8 weeks ago. However, he continues to drink heavily. A+E have found nothing abnormal on physical examination but he is confused. He has received a thiamine infusion, is on an alcohol withdrawal regime and a CT head scan was normal. On review by medicine, he is insistent that he wants to go home. On questioning, he informs you of his address but when asked where he is, he tells you that this is an antique shop and had no idea of the date. He says he has shopping to take home (there is a bag by his side which contains slippers) and wants to discharge himself against medical advice. There are no family members nor does he have any carers. He lives alone and has done so for many years, as you understand from his records. You indicate that you would like him to stay to complete the thiamine infusions. He remains insistent that he is leaving. He has a GCS of 14 (confused) but otherwise entirely normal observations.

(confused) but otherwise entirely normal observations.

Which of the following is the most appropriate approach to the management of this man?

- Allow him to discharge himself against medical advice
- Arrange transfer to psychiatric unit and formal psych assessment utilising a temporary section
- Discharge the patient and arrange for him to be reviewed at home by the liaison psychiatric services
- Institute a deprivation of liberty safeguard
- Temporarily section patient under section 4 of the mental health act and then get this supported by psychiatric team

for him to be reviewed at home by the liaison psychiatric services

Institute a deprivation of liberty safeguard ← Correct answer 35%

Temporarily section patient under section 4 of the mental health act and then get this supported by psychiatric team ✖ Incorrect answer selected 55%

**Explanation:**

This patient clearly lacks the capacity to make an informed decision regarding his discharge and his safety is paramount. In the first instance, the most appropriate approach relating to his ongoing management is for him to have an urgent deprivation of liberty safeguard (DOLS), so that the patient can be treated, including any reversible causes of his confusion, which in this case may well be withdrawal. Sectioning the patient is unnecessary in this scenario as DOLS would provide the best approach and enable the patient to leave should his confusion subside.

This 76 year old man presents to the unit with a one week history of deteriorating skin rash. His skin has become increasingly inflamed and red. He has had little sleep over the last couple of days as he feels unwell and has been itching intensely.

He has no particular history of note other than some mild eczema of the flexural areas. He has been taking Lisinopril, amlodipine, aspirin and simvastatin for many years for hypertension.

What is your diagnosis?

- ○ Chronic angioedema
- ○ Erythroderma
- ○ Lichen planus
- ○ Norwegian Scabies
- ○ Red man syndrome

| | |
|---|---|
| Chronic angioedema | 2% |
| Erythroderma ✔ Correct answer selected | 79% |
| Lichen planus | 1% |
| Norwegian Scabies | 10% |
| Red man syndrome | 8% |

This elderly man with a history of eczema has a widespread erythematous rash involving the majority of his skin. The diagnosis is therefore erythroderma and this may be due to a number of disorders including eczema, psoriasis and mycosis fungoides. In this patient's case the likely diagnosis is erythrodermic eczema and the patient should be treated with cooling baths with emollients and topical steroids. Where infection is also considered, antibiotics such as Flucloxacillin should be employed.

A 54-year-old woman was referred to the acute unit with a 3 month history of generalised muscle pain of hip and shoulder girdles with associated weakness, together with a macular rash on hands and feet. On this occasion, the GP felt it appropriate to admit her as over the last month she had been aware of a 7kg weight loss and some fever. She had no other past history of note and in general avoided contact with the medical profession as she was rather fearful of seeing doctors.

On examination, she appeared slim with a BMI of 21kg/m2 and had macular erythematous patches over the dorsal surface of the hands and feet and also had swelling over the eyelids, which appeared like purplish angioedema. There was a more proximal muscle weakness of the arms and legs and there was tenderness to palpation of the muscles of the arms, shoulder and thighs. Investigations showed:

| | |
|---|---|
| FBC | Normal |
| U+Es | Normal |
| CXR | Normal |
| CRP | 121 mg/l (<5) |

| | |
|---|---|
| U+Es | Normal |
| CXR | Normal |
| CRP | 121 mg/l (<5) |
| Creatine kinase | 1521 u/l (50-200) |
| AST | 450 u/l (0-50) |

Which of the following is the most likely cause for her presentation?

- Hashitoxicosis
- HIV infection
- Illicit drug use
- Ovarian cancer
- Tuberculous adrenalitis

HIV infection 7%

Illicit drug use 1%

Ovarian cancer ✔ Correct answer selected 68%

Tuberculous adrenalitis 2%

In order to get the answer to this question it is important to work out the dermatological diagnosis which is dermatomyositis as reflected by the heliotrope rash on the eyelids and Gottron's patches on the hands and feet. Whilst dermatomyositis can occur in isolation, there is a 3 fold increased risk of underlying malignancy and the weight loss in this patient should point toward that diagnosis. Cancers associated with dermatomyositis include ovarian, lung, pancreatic and colorectal. Treatment is usually with immunosuppressive therapy, typically steroids, methotrexate or cyclophosphamide.

**Further Reading**

- Dermatomyositis

An 18 year old student is admitted after having had a strange reaction where she became acutely unwell after going to a Chinese restaurant. She became light headed and short of breath and she thinks she momentarily passed out. An ambulance was called and she was given oxygen and recovered. She has a history of eczema but nothing else. On examination, there is nothing to find and she seems fine. Blood results are normal.

Which of the following tests could be used to assess if this were an anaphylactic reaction?

- Alpha-1 antitrypsin
- C1-esterase
- C4 complement
- C-reactive protein
- Mast cell tryptase

| | | |
|---|---|---|
| ○ | C4 complement | 1% |
| ○ | C-reactive protein | 0% |
| ○ | Mast cell tryptase ✔ Correct answer selected | 82% |

Mast cell tryptase is the molecule to measure in suspected anaphylaxis as the mast cells release this in abundance in anaphylaxis with concentrations rising abruptly within 30 minutes to 1 hour. C1 esterase deficiency is a cause of repeated episodes of anaphylaxis but this is not the molecule to measure. As in this case, the measurement of mast cell tryptase may differentiate between a faint and anaphylaxis where doubt exists.

**References:**

A 50 year old man returns home from a business trip to India complaining of watery and offensive diarrhoea. This started two days from the end of his trip and is associated with abdominal pains and watery diarrhoea at least 5 -6 times per day. The symptoms have continued over the last 10 days and now he seeks advice regarding treatment. He is up to date with regard to immunisations including hepatitis A and B.

His GP has undertaken 3 separate stool cultures together with microscopic examination for cysts and ova, all of which were negative. Similarly C.diff toxin was not detected.

Which of the following is the most appropriate approach to the management of this patient?

- Repeat stool cultures and withhold any treatment
- Treat with bismuth salicylate
- Treat with ciprofloxacin
- Treat with co-trimoxazole
- Treat with loperamide only

Repeat stool cultures and withhold any treatment — 9%

Treat with bismuth salicylate — 4%

Treat with ciprofloxacin ✔ — 49%

Correct answer selected

Treat with co-trimoxazole — 6%

Treat with loperamide only — 31%

This patient has had traveller's diarrhoea for longer than 5 days and is badly affected by it. Guidance would recommend stand-by treatment with 3 days of ciprofloxacin or a macrolide.

A 20 year old female is admitted with nausea and vomiting which commenced after she ate a pizza approximately 4 hours earlier. She felt nauseous had some associated abdominal pain and developed profuse vomiting. She has been unable to keep anything down and has become weaker. She is 29 weeks pregnant with her second child and the pregnancy is doing well. Observations are generally fine, she seems slightly dehydrated yet investigations are normal. She is treated with an IV infusion of normal saline but is distressed by the vomiting.

Which of the following would be the most appropriate approach to managing the nausea and vomiting?

- ○ Continue IV fluids only and no anti-emetics
- ○ IV Dexamethasone
- ○ IV Metoclopramide
- ○ IV Ondansetron
- ○ IV Prochlorperazine

- Continue IV fluids only and no anti-emetics — 13%
- IV Dexamethasone — 5%
- IV Metoclopramide ✔ Correct answer selected — 36%
- IV Ondansetron — 24%
- IV Prochlorperazine — 23%

This young woman, who is in her second pregnancy, is likely to have acquired S Aureus food poisoning and is particularly symptomatic as a consequence. The most appropriate approach is to prescribe an antiemetic, and the drug with greatest safety data associated with its use in pregnancy is metoclopramide. Other recommended agents include antihistamines such as cyclizine.

A 53 year old man is admitted with a 3 day history of left leg pain and fever. He has an 8 year history of type 2 diabetes for which he takes metformin and gliclazide together with ramipril and simvastatin.

On examination his BMI is 32.3 kg/m2, his temperature is 38.5C, pulse 90 bpm and his blood pressure 120/80 mmHg. His left leg is swollen to mid-calf, the skin is red and inflamed with a clear demarcation just below the knee. He has some onycholysis of the left toe nails with some maceration between the toes. His peripheral pulses are all palpable.

Results show:

| | |
|---|---|
| Sodium | 136 mmol/l (134-144) |
| Potassium | 4.2 mmol/l (3.5-5.5) |
| Urea | 12.1 mmol/l (3-8) |
| Creatinine | 128 micromol/l (50-100) |
| Haemoglobin | 13.3 g/l (120-160) |
| White cell Count | $12.8x10^9$/l (3-10) |
| Platelets | $158x10^9$/l (140-450) |
| C-Reactive Protein | 135 mg/dl (<5) |
| Glucose | 12.3 mmol/l |
| HbA1c | 7.8% (<6) |

Which of the following would be the most appropriate treatment for this patient?

- ○ IV flucloxacillin
- ○ Oral amoxicillin
- ○ Oral ciprofloxacin
- ○ Oral flucloxacillin
- ○ IV Vancomycin

| | |
|---|---|
| IV flucloxacillin ✔ Correct answer selected | 84% |
| Oral amoxicillin | 2% |
| Oral ciprofloxacin | 1% |
| Oral flucloxacillin | 10% |
| IV Vancomycin | 5% |

This patient has a clinical class II to class III cellulitis with systemic upset associated with a comorbidity. The vast majority of cases of cellulitis are due to beta haemolytic strep or S Aureus. Therefore, Flucloxacillin is the treatment of choice in this setting and recommended in guidelines as IV treatment in Class II-III patients. In subjects allergic to beta lactams, clarithromycin/clindamycin can be used.

- Guidance on management of cellulitis in adults

Next

Exit

Question ID #7041

A 24-year-old male presented with acute onset evolving pain over a period of 10 minutes in the right hand. He was aware of redness and pain in that arm and hand and went to A+E who referred him to medicine. By the time he was seen which was about 3 hrs later the pain and redness had subsided. He described this pain as 8/10 hat developed when he was asleep. He described a similar episode occurring about one month before after taking a bath. There was no other medical history of note.

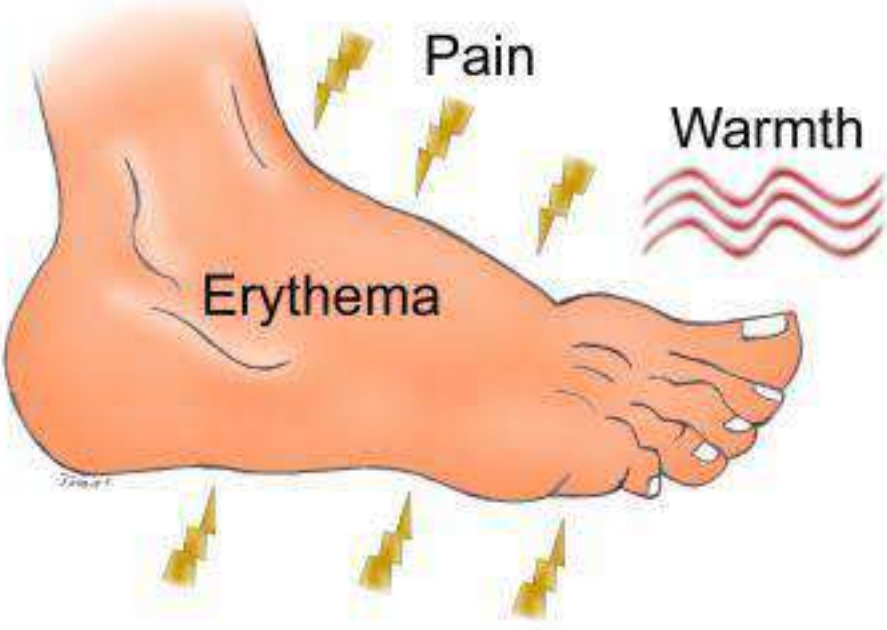
He had some purplish discolouration of the tips of the fingers of the right hand. Neurological examination was normal. All pulses were palpable and cardiovascular examination was otherwise normal. There were no splinter heamorrhages and examination in all other parts of the body were normal.

FBC – Normal, U+Es/Calcium/LFTs – Normal, CRP 5 g/l. CXR - Normal

Which of the following is the most likely diagnosis?

- Erythromelalgia
- Infective endocarditis
- Raynaud's Phenomenon
- Subclavian Steel Syndrome
- Systemic sclerosis

# The Cardinal Symptoms of Erythromelalgia



Peer responses

| | | |
|---|---|---|
| ○ | Erythromelalgia ✔ Correct answer selected | 23% |
| ○ | Infective endocarditis | 1% |
| ○ | Raynaud's Phenomenon | 44% |
| ○ | Subclavian Steel Syndrome | 29% |
| ○ | Systemic sclerosis | 3% |

Explanation:

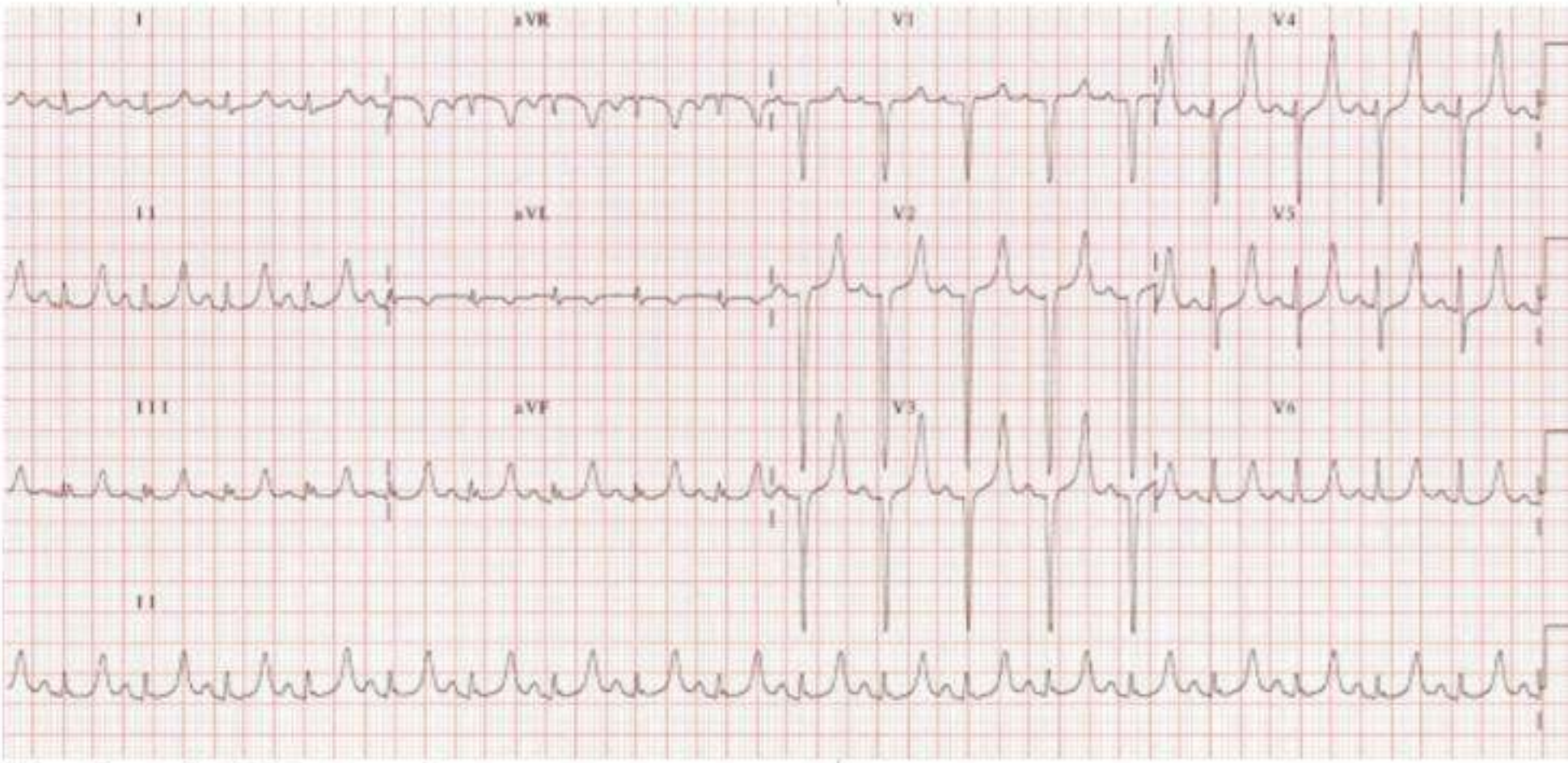
Erythromelalgia is a rare disorder associated with redness, pain, can be bilateral and is usually precipitated by the person being hot. It can be primary or secondary and treatment includes cooling and NSAIDs. Infrared thermography can often help in the diagnosis.

Reference:

# Acute Medicine SCE Revision Other

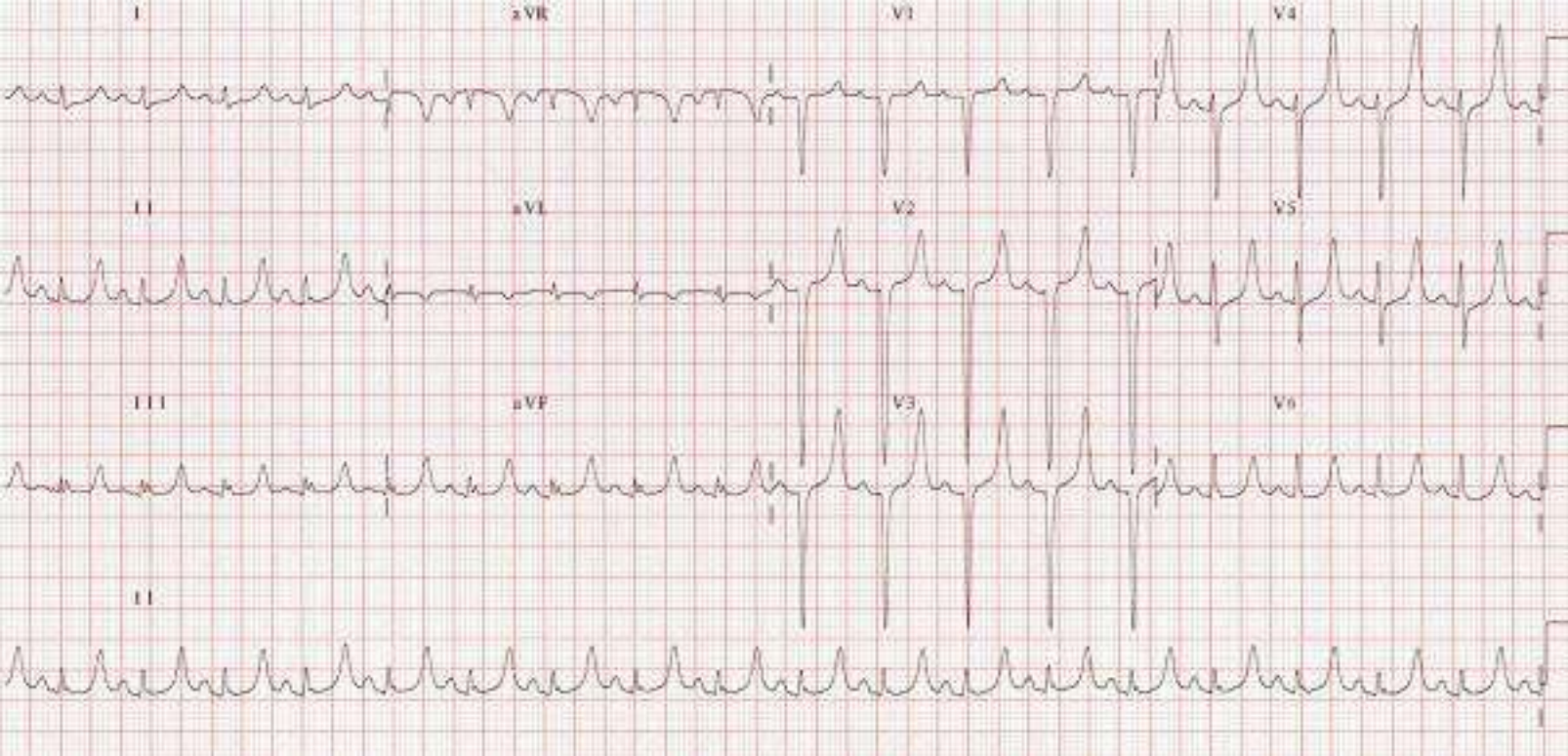
Question ID #3780

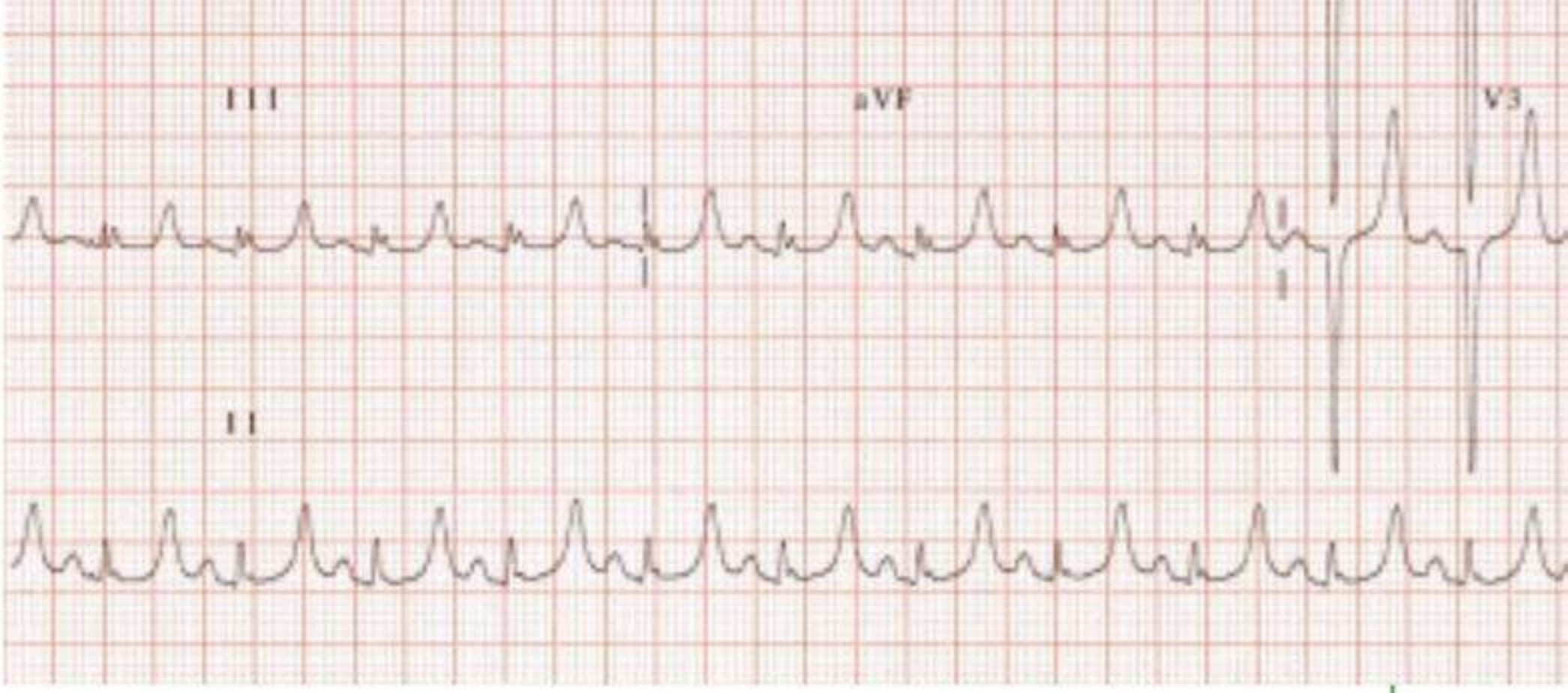
This is the ECG obtained on a 77 year old man with type 2 diabetes who was admitted with lethargy and tiredness.




What does the ECG suggest?

- Hypercalcaemia
- Hyperkalaemia
- Hypocalcaemia
- Hypokalaemia
- Hypothermia


I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
II




What does the ECG suggest?

Peer responses

- Hypercalcaemia 2%
- Hyperkalaemia ✔ Correct answer selected 94%
- Hypocalcaemia 1%
- Hypokalaemia 1%
- Hypothermia 2%

This ECG shows tented T waves and p waves with a tachycardia suggestive of hyperkalaemia.

A 32 year old female presents with hypokalaemia and metabolic alkalosis. She has a blood pressure of 124/76 mmHg. Her biochemistry shows:

| | | |
|---|---|---|
| **Sodium** | 135 mmol/L | (135-145) |
| **Potassium** | 3.2 mmol/L | (3.5-5.5) |
| **Mg** | 0.4 mmol/L | (0.7-1.0) |
| **HCO3** | 28 mmol/L | (18-23) |
| **Plasma renin activity** | 5.5 nmol/L | (0.5-2.2) |
| **Aldosterone** | 722 pmol/L | (100-500) |

What is the likely underlying diagnosis?

- ○ Bartter`s syndrome
- ○ Congenital adrenal hyperplasia
- ○ Conn's syndrome
- ○ Gitelman`s syndrome
- ○ Liddle`s syndrome

wasting, and hypercalciuria, which resolve two to six weeks after drug termination.

Aminoglycosides are polycations, which act as calcimimetics and can activate the CaSR [57]. Thus, this disorder may represent an acquired form of type V Bartter syndrome (see 'Type V' above). Alternatively, direct drug-induced tubular damage may be the etiologic mechanism.

## Gitelman syndrome

**Clinical features** — Gitelman syndrome is an autosomal recessive disorder that usually presents with hypokalemia, metabolic alkalosis, hypomagnesemia, hypocalciuria, and normal blood pressure [8,12,15,58,59]. In contrast to the typical prenatal or neonatal clinical presentation of many patients with Bartter syndrome, Gitelman syndrome is usually not diagnosed until late childhood or adulthood [15], although presentation in infancy has been described [51]. The clinical manifestations are less pronounced in heterozygotes. (See 'Clinical manifestations in heterozygotes' below.)

| | |
|---|---|
| Congenital adrenal hyperplasia | 4% |
| Conn's syndrome | 12% |
| Gitelman`s syndrome ✔ Correct answer selected | 28% |
| Liddle`s syndrome | 24% |

Gitelman`s syndrome is characterised by mutation in the SCL12A3 gene that encodes for a Na-Cl transporter at distal convoluted tubule. As a result the affected individuals develop Na loss (salt wasting), hypovolemia, hypocalciuria, hypomagnesaemia and metabolic alkalosis. The fluid loss prompts activation of Renin-Angiotensin system leading to increase in both renin and aldosterone levels. The main differential diagnosis for Gitelman`s syndrome includes Bartter`s syndrome which usually affects children (rarely young adolescents). In contrast to Gitelman`s syndrome the primary defect in Bartter`s syndrome is at Na-K-Cl transporter in ascending limb of loop of Henle, hypomagnesaemia is absent and patients usually have hypercalciuria.

You attend a 18 year old man who has developed facial swelling, light-headedness and difficulty breathing following exposure to food suspected to have nut content. On immediate assessment you note that he has swelling of the lips and eyes with a widespread red blotchy rash. He is particularly wheezy, with a respiratory rate of 28/min, a pulse of 110 bpm and a supine blood pressure of 100/70 mmHg. Which of the following would be the most appropriate immediate treatment for this patient?

- IM adrenaline
- IM chlorpheniramine
- IV adrenaline
- IV hydrocortisone
- No treatment needed other than careful observation

IM adrenaline ✔ Correct answer selected — 95%

IM chlorpheniramine — 0%

IV adrenaline — 4%

IV hydrocortisone — 1%

No treatment needed other than careful observation — 1%

This patient has developed a severe allergic reaction to nuts causing the swelling and rash but more worryingly he also has features of anaphylaxis, with difficulty breathing and wheeze. He requires urgent treatment and the acknowledged first line treatment for anaphylaxis is IM adrenaline. The dose varies according to age and in a child of this age the recommended dose should be 0.5mls of 1:1000 adrenaline (with the prefered site being the outer upper thigh). The injection can be repeated every 5-10 minutes until the patient's condition stabilises. Adjuvant therapies can be given. These include high flow oxygen , IV fluids, nebulised bronchodilators, corticosteroids and antihistamines (such as chlorphenamine) . IV adrenaline is not recommended as a first line treatment and should only be given by experienced specialists.

You are called to see a 42 year old male patient on the neurosurgical ward. He was admitted with a head injury 3 days ago which required only observation. However, he has become more confused in the last 12 hours and his most recent U+Es performed this morning reveal:

| | |
|---|---|
| Sodium | 125 mmol/l (134-144) |
| Potassium | 4.5 mmol/l (3.5-5.5) |
| Urea | 6.8 mmol/l (3-8) |
| Urine Osmolality | 620 mosmol/l |
| Urine Sodium | 125 mmol/l |

Checking through his records, the previous days his U+Es were normal. He had been allowed to eat and drink normally and had stopped IV fluids 2 days ago. He was on dexamethasone the dose of which had been reduced to 4mg daily from 8 mg daily over the last day but he was on no other treatment.

On examination, he had Glasgow Coma Scale of 15, though seemed confused with him being disorientated. Oxygen saturations were 97% on air and his blood pressure was 110/80 with a pulse of 88 bpm.

Which of the following is the most likely diagnosis?

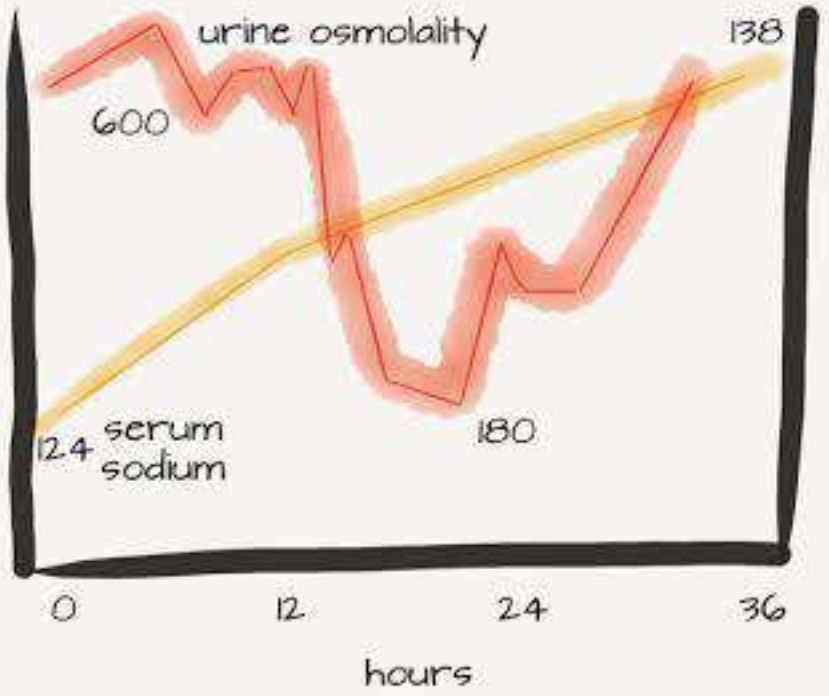
- ○ Acute hypoadrenalism
- ○ Cerebral Salt Wasting
- ○ Pituitary apoplexy
- ○ Syndrome of inappropriate ADH secretion
- ○ Type IV renal Tubular acidosis

# Cerebral Salt Wasting Syndrome (CSWS)

- **Cerebral** salt-**wasting syndrome** (CSWS) is a rare endocrine condition featuring a **low blood sodium** concentration and **dehydration** in response to **trauma/injury** or the presence of **tumors** in or surrounding the **brain**.

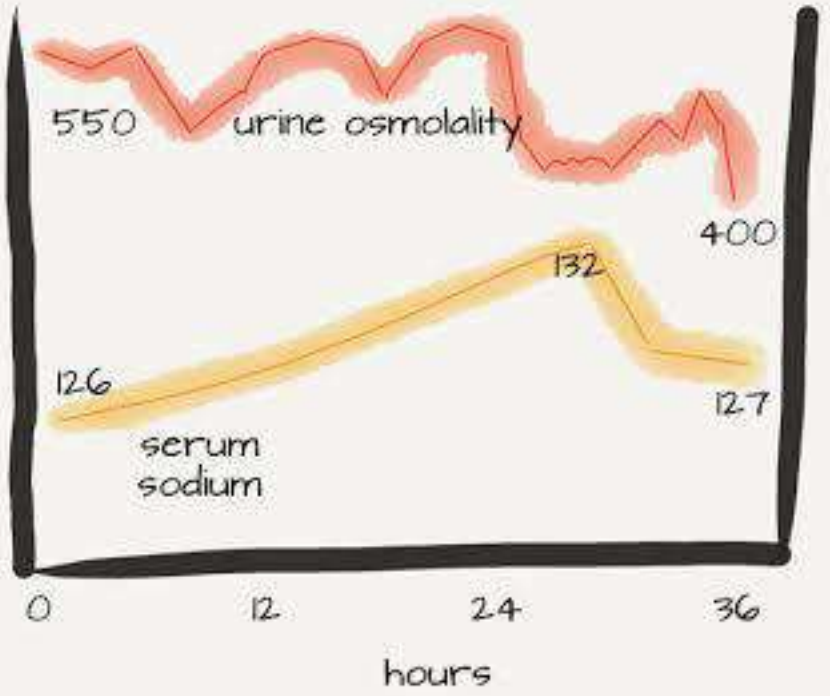
# Cerebral Salt Wasting

0.9% NS running at 50 ml/hr




# SIADH

0.9% NS running at 50 ml/hr



| Differential clinical or biochemical parameter | CSWS | SIADH |
|---|---|---|
| Plasma volume | ↓ | ↑ or normal |
| Sodium balance | Negative | Variable |
| Volume depletion signs and symptoms | Present | Absent |
| Weight | ↓ | ↑ or no change |
| Pulmonary capillary pressure | ↓ | ↑ or normal |
| Central venous pressure | ↓ | ↑ or normal |
| Haematocrit | ↑ | ↓ or no change |
| Serum osmolality | ↑ or normal | ↓ |
| Urea nitrogen/creatinine ratio | ↑ | Normal |
| Serum protein level | ↑ | Normal |
| Urinary sodium level | ↑↑ | ↑ |
| Urinary potassium level | ↑ or no change | ↓ or no change |
| Uric acid level | Normal | ↓ |
| Hyponatraemia during furosemide test | Persistent | Correction |

CSWS, cerebral salt-wasting syndrome; SIADH, inappropriate secretion of ADH syndrome; ↓, decreased; ↑, increased; ↑↑, significant increase.
[a]Modified from reference 15: Harrigan MR. Cerebral salt wasting syndrome: a review. *Neurosurgery* 1996 **38** 152–160.

Acute hypoadrenalism 3%

Cerebral Salt Wasting ✔ 24%

Correct answer selected

Pituitary apoplexy 2%

Syndrome of inappropriate ADH secretion ✖ 72%

Incorrect answer selected

Type IV renal Tubular acidosis 0%

The most likely diagnosis in this patient with head injury who then develops acute symptomatic hyponatraemia and grossly elevated urine sodium is cerebral salt wasting. The grossly elevated urine sodium (>100) is highly suggestive as the sodium is usually less with SIADH. Similarly with SIADH, there is a dilutional element so urea and potassium typically reflect this dilution being themselves low normal in contrast to CSW where there is hypovolaemia and hence higher concentrations. Hypoadrenalism is an incorrect answer as the patient is already on a high dose of steroids – dexamethasone 4mg/d.

A 55 year old man is admitted through MAU with 1 week history of deteriorating weakness and more recent nausea. His background includes a 10 yr history of diabetes and hypertension. He is taking gliclazide 80mg bd, bendrofluazide 2.5mg/d, atorvastatin 10mg/d and ramipril 10 mg/d.

On Examination he appears ill and weak. His temperature is 37 C and oxygen saturation is 97% on air. His blood pressure is 154/100 mmHg, heart rate 92 bpm reg and respiratory rate is 22/min.

Results:

| | |
|---|---|
| Sodium | 141 mmol/l (134-144) |
| Potassium | 7.6 mmol/l (3.5-5.5) |
| Urea | 19 mmol/l (3-8) |
| Creatinine | 350 micromol/l (50-100) |
| pH | 7.36 |
| Bicarbonate | 20 mmol/l |

His ECG reveals some QRS widening and tenting of T waves.

Which of the following is the most appropriate initial treatment for this man?

- ○ 10mg nebulised salbutamol
- ○ 10mls 10% IV calcium gluconate as a stat dose
- ○ 100mls of 8.4% sodium bicarbonate given over 30 mins
- ○ 50mls IV 50% dextrose plus 10 iu insulin given over 10 mins
- ○ Oral Calcium resonium

10mls 10% IV calcium gluconate as a stat dose ✔ Correct answer selected — 88%

100mls of 8.4% sodium bicarbonate given over 30 mins — 0%

50mls IV 50% dextrose plus 10 iu insulin given over 10 mins — 12%

Oral Calcium resonium — 0%

This patient has severe and life threatening hyperkalaemia as determined by the potassium above 6.5 and the widened QRS complexes and tented T waves on the ECG. The most important initial step is protection of the heart – hence the patient should receive 10 mls calcium gluconate and the ECG should be repeated to look for improvement. At the same time, the insulin and dextrose infusion should be started, although this may take 1 hour to take effect by reducing the potassium. In this case, the ACE inhibitor needs to be stopped and in conjunction with the acute kidney injury may be the precipitant.

A 74 year old woman presents to clinic with a number of Leg ulcers. She has longstanding rheumatoid arthritis and had stopped her Methotrexate therapy over one year ago. Her weight has been stable. She is not keen on further therapy but is frustrated that she has had 6 months of troublesome leg ulcers. Abdominal examination reveals an 8cm mass in the left upper quadrant that is dull to percuss and descends on inspiration.

Her investigations are below:

| | | |
|---|---|---|
| **Haemoglobin** | 10.9 g/dL | (13 - 18 g/dL) |
| **WBC** | 2.4 x$10^9$/L | (4 -11 x$10^9$/L) |
| **Neutrophils** | 0.7 x$10^9$/L | (>2 x$10^9$/L) |
| **Lymphocytes** | 1.5 x$10^9$/L | (>1 x$10^9$/L) |
| **Platelets** | 85 x$10^9$/L | (150 - 400 x$10^9$/L) |

What is the most likely explanation for her symptoms?

- ○ Chronic lymphocytic leukaemia
- ○ Felty's syndrome
- ○ Methotrexate induced pancytopenia
- ○ Myelofibrosis
- ○ Occult Malignancy

Chronic lymphocytic leukaemia 0%

Felty's syndrome ✔ Correct answer selected 88%

Methotrexate induced pancytopenia 2%

Myelofibrosis 9%

Occult Malignancy 1%

This long standing patient with rheumatoid arthritis has the triad of Neutropenia, Splenomegaly and leg ulcers. This is Felty's syndrome. Patients may also have other haematological findings including thrombocytopenia, anaemia and pancytopenia. Methotrexate induced pancytopenia would not occur a year after stopping therapy.

Felty's syndrome ties in all the features of this presentation, and the other diagnoses would not account for all these features.

A 62 year old woman is referred to the medical intake with tingling and paraesthesia. The patient has been aware of deteriorating symptoms for one week. The GP asks whether this is a stroke. She has a background history of type 2 diabetes, hypertension and GORD for which she takes omeprazole, metformin, sitagliptin, simvastatin, Ramipril and amlodipine. On examination there is little of note.

Investigations reveal:

| | |
|---|---|
| Calcium | 2.06 mmol/l (2.2-2.6) |
| Magnesium | 0.3 mmol/l (0.7-1) |
| LFTs | Normal |

You see on the computer that a 25OHD level checked 1 month before by the GP reveals a level of 18 nmol/l (>50)

Which of the following is the likely cause of this patient's presentation?

- ○ Diabetic autonomic neuropathy
- ○ Metformin
- ○ Omeprazole
- ○ Sitagliptin
- ○ Vitamin D deficiency

A 67-year-old lady, who normally uses a stick to walk, is admitted following a fall. She describes a feeling of her head spinning and frequent dizzy spells which are worse when she leans forward. She has had 2 falls in the last 2 days. She has a history of diabetes, hypertension and previous CABG for coronary artery disease. She takes metformin 500 mg BD, ramipril 5 mg OD, aspirin 75 mg OD, bendrofluazide 2.5 mg OD and atorvastatin 80 mg OD. Clinical examination is unremarkable with no cardio-respiratory or neurological abnormalities. There is no postural drop in her blood pressure. What is the most likely cause of her falls?

- ○ Benign positional vertigo
- ○ Cervical spondylosis
- ○ Gait dyspraxia
- ○ Posterior circulation transient ischaemic attacks
- ○ Vestibulocochlear neuritis

Ufone 11:28 AM 42%
studyprn.com

- Benign positional vertigo ← 63%
  Correct answer
- Cervical spondylosis 5%
- Gait dyspraxia 4%
- Posterior circulation transient ischaemic attacks ✖ Incorrect answer selected 19%
- Vestibulocochlear neuritis 9%

**Explanation**

Benign paroxysmal positional vertigo (BPPV), the most common cause of vertigo encountered in clinical practice is defined as 'a disorder of the inner ear characterized by repeated episodes of positional vertigo', meaning that symptoms occur with changes in the position of the head (NICE, 2017). It can present in patients of any age, but commonly appears between the fifth and seventh decades of life. Women are more commonly

A 55 year old female with recently diagnosed bowel carcinoma presents with painful swelling of the left leg and is diagnosed with a proximal deep vein thrombosis. She is initially treated with low molecular weight heparin. With regard to longer term anticoagulation, which of the following is the most appropriate treatment for this patient?

- Apixaban
- Continue with low molecular weight heparin
- Fondaparinux
- Unfractionated Heparin
- Warfarin

Peer responses

| | |
|---|---|
| Apixaban | 13% |
| Continue with low molecular weight heparin ✔ Correct answer selected | 72% |
| Fondaparinux | 1% |
| Unfractionated Heparin | 0% |
| Warfarin | 14% |

Studies suggest an approximate 50% reduced risk of developing recurrent thromboembolism with LMWH vs Warfarin in subjects with carcinoma. Hence, this treatment is recommended in preference to vitamin K antagonists.

A 56 year old woman attends A&E feeling unwell. She has a history of metastatic breast cancer for which she is receiving palliative treatment. Her Calcium concentration is 3.8 mmol/l and she is receiving appropriate treatment. You, as a senior opinion, have a discussion with the patient, relating to resuscitation in the event of a cardiac arrest and what she would want in that circumstance. She states that she would want CPR if she were to arrest and you judge her to be competent. On a clinical level you disagree with this decision and explain to her fully what CPR entails and that she would still receive all appropriate treatment. However, she still insists that she wants CPR in an arrest situation.

Which of the following is the appropriate management for this patient concerning a DNACPR decision?

- ○ Institute a DNA CPR despite the patient's wishes
- ○ Institute a scaled CPR response where CPR can be initiated at arrest without escalation of care to ITU
- ○ Make the patient for resuscitation in the event of an arrest
- ○ Obtain the family's support for DNA CPR and then institute it
- ○ Offer the patient a second opinion regarding CPR

Make the patient for resuscitation in the event of an arrest — 16%

Obtain the family's support for DNA CPR and then institute it — 5%

Offer the patient a second opinion regarding CPR ✔ Correct answer — 51%

selected

A difficult situation that arises not infrequently. Guidance suggests that the doctor determines treatment and that whilst the patient wants CPR this may not be in the interests of the patient nor of the team undertaking a futile crash call. Therefore, you can order DNACPR but you should offer the patient a second opinion.